



# COAL AGE



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## Let The Other Fellow Help

**M**R. MINE BOSS: You don't know it all. If you were to be sick for a month, the mine would not stop. If you were to die, the mine would keep on running. You have heavy responsibilities, but there is no need to carry them with a grimace.

The plant must be kept going, but there is no need for you to do it all yourself. You have subordinates who are able and willing to help as soon as you lose your frown.

When you lay off that north switch you can get some valuable pointers from your boss-tracklayer. He helped locate switches when you were in school.

When you put those new men on the tipple, ask the weigh-boss a question or two. He knows something about the disposal of the tipple force; his work has been on the tipple and nowhere else since

the time he began to work at the mines.

When you have the repairs made on that motor-road trestle, do not say, "Do it thus," but say instead, "It can be done in this manner. Can anyone suggest a better plan?" And that new carpenter you put on last week will step forward with some helpful suggestions. He understands that class of work, for he spent two years in a railway bridge-gang.

That little trapperboy in the eighth east visited a neighboring mine one idle day last month, and if it were not for your stern expression he would like to tell you of a trap-door he saw there.

### Listen to Advice

#### ENCOURAGE

*your men to make suggestions. You will thereby increase their interest and loyalty, the result of which will be higher efficiency all around.*

Learn that the collective experience of men is more valuable than the individual experience of a man.

Keep an open mind and a civil tongue.

Observe—ask questions.

# Longwall Mining in Alberta

By E. L. LEBLANC\*

**SYNOPSIS**—A successful longwall lignite mine which is worked only during the winter months, but is apparently in fit condition for operation after the long summer idleness.

Longwall advancing is being operated successfully in the lignite coal field of southeastern Alberta. The operation is known as the Block coal mine and is located about  $3\frac{1}{2}$  mi. north of Taber. The lignite is covered by 150 ft. of measures, the cross-section of the bed and its overlying strata being as follows:

CROSS-SECTION OF BED AND COVER	
Strata	Thickness
Mixed clay and shale.....	20 to 40 ft.
Sandstone .....	3 to 15 ft.
Soft shale .....	4 to 7 in.
Bone .....	8 to 18 in.
Clod .....	$3\frac{1}{4}$ to 4 ft.
Lignite .....	
Soft fireclay .....	

APPROXIMATE ANALYSIS OF THE COAL	
Constituent	%
Fixed carbon .....	50
Volatile matter and moisture.....	44
Ash .....	6

The face cleats run N 62° E, and the butts at right angles (N 28° W). The seam dips N 22° E, 7 in.

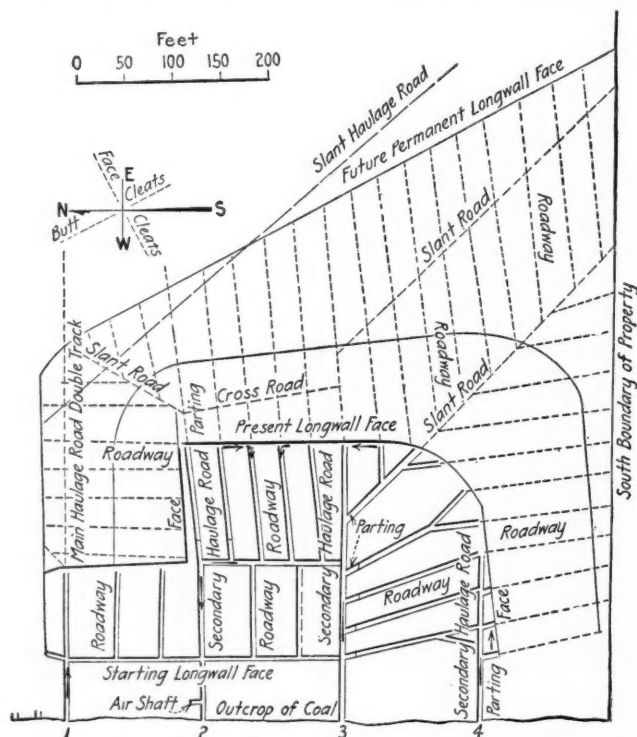


FIG. 1. GENERAL PLAN OF THE BLOCK COAL MINE, TABER, ALTA.

in every 100 ft. and outcrops along the banks of the Lethbridge River.

The mine was opened in July, 1913, by four parallel single entries driven due east on 140-ft. centers. Three of these entries were connected as soon as marketable coal was reached, and longwall advancing was started with a 280-

ft. face. Roadways were turned off the crossroads at 46-ft. centers.

## GIVING THE LONGWALL A REST OF ABOUT FIVE MONTHS

Mining was discontinued in March, 1914. The coal was well spragged under the last undercut, and a few cribs were built along the face. As a result when the mine was started up in September, 1914, the only trouble experienced was from the increased percentage of slack in the coal of this one cut which had been holed five months previously. But the next undercut was made under fresh roof, and here the percentage of lump was normal. Instead of the roadways being driven with 46-ft. centers, thereafter they were started every 30 ft. As this demanded less handling of the coal at the face, the percentage of lump increased.

## COAL WORKS BEST IF LONGWALL FOLLOWS THE BUTTS

As seen in Fig. 1, the cross and slant roads are turned off usually every 150 ft., with 175 ft. as a maximum. At

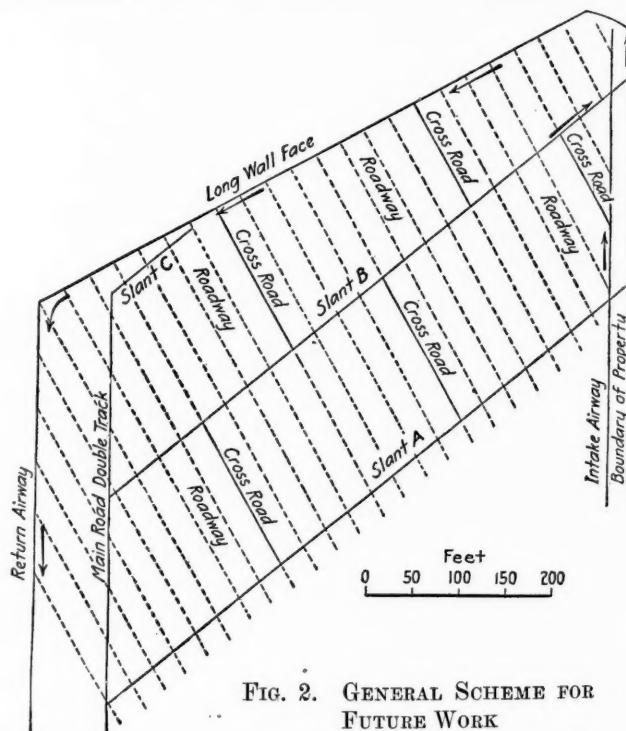


FIG. 2. GENERAL SCHEME FOR FUTURE WORK

present the longwall face is nearly 600 ft. long, 250 ft. of which is parallel to the butts and 320 ft. more or less in the direction of the face cleat. In the near future the entire longwall face will be made to follow the line of the butts. Experience has proved that if the longwall face is made in this direction the largest lumps of coal will be produced.

The mine was opened up to have the longwall face at an angle to the butts, because the roof was bad and conditions unfavorable; a few mines had tried this system but failed. So to make longwall a success, it had to be worked carefully and the system modified. Results have proved it successful with these changes. As shown in Fig. 2, when

\*Taber, Alta., Can.

slant *C* will reach the boundary, slant *A* will already be cut off. As the coal will always come from only two slant roads an endless-rope haulage may be used in the main road as soon as distance renders the change advisable.

In future slant roads will be turned off the main haulage at 175-ft. centers. Secondary-haulage roads, or crossroads, will be turned off the slant roads at 240-ft. centers, and ordinary roadways will be spaced 30 ft. apart, center measurement (see Fig. 2).

#### UNDERCUTTING IS DONE IN CLAY OR IN BOTH CLAY AND COAL

In mining the coal, it is first undercut by electrically operated Pick-Quick bar coal-cutter longwall machines.

The runners measure from 6 to 8 in. in diameter, but are sawed along their length so that they measure only 3 in. by 4 in. by 12 ft. The scraper cleans out the dirt lying below the undercut and pulls out all the sprags, or at least some of them.

The advantage of this Pick-Quick machine is that if the coal should fall on the bar, the machine can proceed and the bar will clear itself. The power consumption is low, and no narrow work in developing is required. After the coal is undercut and the sprags drawn, if the roof pressure does not bring the coal down, the cut is shot, a half a stick (or  $\frac{1}{8}$  lb.) of Monobel being used to bring it down.

The coal is loaded with a fork, and the slack remain-

ing is then put into a car, so that as little of the coal as possible is gobbled and all the room required saved for the brushing of rock. Brushing at the face of the roadway is done by loaders, and timber is then set up at  $4\frac{1}{2}$ -ft. centers. Timbering in the roadway is set up as shown at *a*, *b*, *c*, in the upper part of Fig. 3, conditions determining which plan is chosen.

#### PROTECTION AGAINST UNDUE PRESSURE BREAKING POSTS AND SHEARING ROOF

It will be noticed that all posts set up at the face are tapered so that they will sink in the floor as the roof settles under the weight. When the ribs are moderately hard, it is better not to put any posts to the booms.

Where the roads meet, cribs are built to strengthen the corners as in the lower part of Fig. 3. These cribs are built on top of 10 to 12 in. of dirt, so as to yield to the roof pressure and prevent shear in the roof. The slants and crossroads are brushed after the roof has completely settled, so that they are 6 ft. high above the rail and timbered whenever possible, as is shown in the center road in the upper part of Fig. 3, the dirt being taken out of the mine or stowed in old roadways.

The mine has not been worked regularly because the coal has had to be hauled  $3\frac{1}{2}$  miles by teams to the Taber station. If a railway spur were built to the mine, 200 tons of screened coal could be produced daily, and this output could be increased rapidly as the longwall face can be extended at will. A second longwall machine would double the output in a short time.

The mines in the lignite field do not work during the summer months, which is a disadvantage to the longwall system of mining, but by spragging the coal properly and strengthening the timbering of the last cut before discontinuing, this disadvantage is easily overcome.

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Electric conductors and telegraph wires are often either tinned or galvanized. The wire is first passed through a tank of acid, which cleans it; next through a tank of water, where the acid is washed off, then through a flux, and finally through molten tin or zinc. It is not difficult to get the tin or zinc to adhere over almost the entire surface, but the perfection demanded requires that every portion of the wire must be covered with a uniform thickness of metal, which must be bright and which will not peel off nor crack.

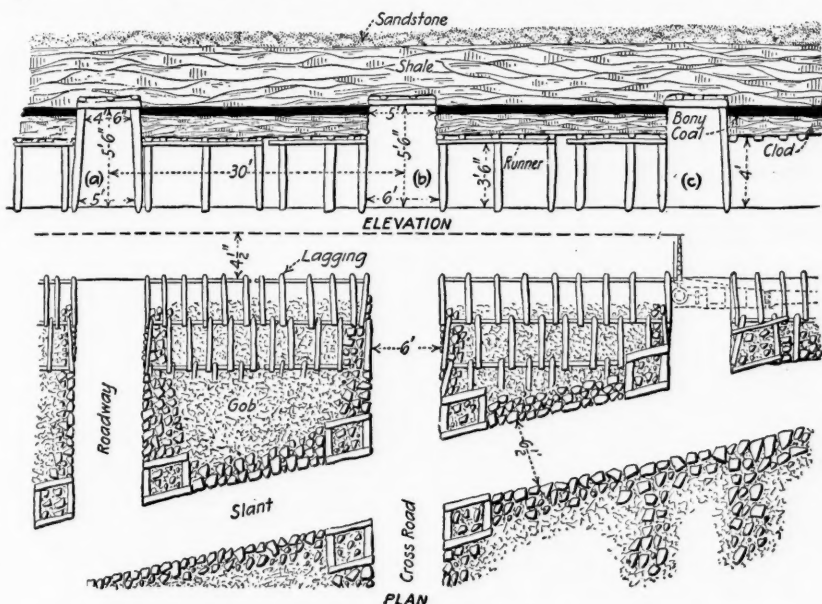


FIG. 3. PLAN AND VERTICAL CROSS-SECTION OF LONGWALL WORKINGS, SHOWING MANNER OF PROPPING AND CRIBBING

On the average a cut  $4\frac{1}{2}$  ft. deep and 350 ft. long is made per day, the holing being done in the clay bottom. Where, however, the bottom clay is wet, the holing is made partly in the coal. A 6-in. kerf is cut, and four men are required to operate the machine—a machine runner, a barman, a scraper and a timberman.

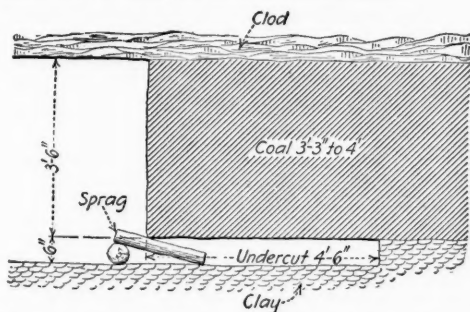


FIG. 4. SPRAGGING METHOD ADOPTED FOR LONGWALL FACE

As the machine proceeds, the barman gobs the dirt brought out by the machine bar and sets sprags under the coal every 15 ft., after which the timberman timbers the face (see Fig. 3). Laggings are set up under the clod or draw-slate and are supported by runners 12 ft. long. Each runner is propped by three posts 4 in. in diameter.



# A Square Working-Place with an Overcutting Machine

BY E. C. DE WOLFE\*

*SYNOPSIS—This center-cutting machine is so constructed that as the cutter-bar makes its sweep across the coal face its end travels in a straight line from rib to rib. This movement of the bar end assures at all times a square working-place.*

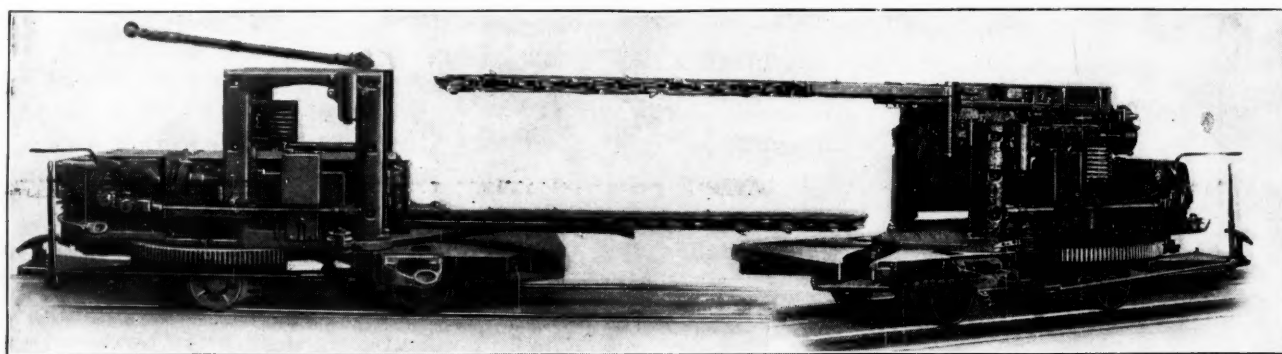
Natural standards of practice develop as time and experience demonstrate what is really best. Nothing in coal mining is more definitely established as a feature of good practice than the squareness of face for which all miners strive.

The pick-worker prides himself on the uniform squareness of his place. Operators of the puncher and the breast and shortwall types of chain machines all have aimed to undercut a uniform depth across a straight face. It is eminently proper, then, that a further develop-

ably circumstances under which the undercutter will still make the better showing. For the more special conditions to which it is particularly well fitted, however, the overcutter is assured a definite field of utility.

The "Straightface" overcutter, made by the Goodman Manufacturing Co., Chicago, is a full-functioned machine, doing in simple manner everything that the coal operator can reasonably wish his cutting equipment to do. In cutting a straight face and straight ribs it does what no other continuous cutter has attempted, and to this extent it does what no other machine is expected to accomplish.

Fig. 1 shows the machine as arranged for "center cutting," while in Fig. 2 it is shown with the cutting element inverted to make it a "top cutter." This feature is at the disposal of the operator for conversion of the machine at any time to suit his conditions or prefer-



FIGS. 1 AND 2. SHOWING THE MACHINE WITH CUTTER-BAR LOWERED FOR CENTER CUTTING AND RAISED FOR TOP CUTTING

ment in coal-cutters should avoid violation of this well-established requirement of economy and general desirability.

An overcutting machine has just been developed which operates wholly by power, from a position on the track, makes its kerf at any height from low center to top of seam, cuts a straight face and leaves straight ribs. It thus combines the advantages of overcutting, in seams wherein this method is preferable, with maintenance of a square face in entries and rooms.

There should be no ill-considered adoption of the overcutting method in coal mining. Only an overflow of unrestrained enthusiasm would urge that any overcutting machine can be best adapted for use under all conditions, and the cautious operator will proceed only on proper consideration of the physical conditions to be met and the economic results to be attained.

The overcutter, in work to which it is suited, will often be the means of practical and profitable operation in situations otherwise extremely difficult. It may increase the production, lower the costs and improve the general mining conditions in many workings which today are quite satisfactorily served by the shortwall and breast types of undercutters, yet there are unquestion-

ences. For each arrangement there is a considerable range of vertical adjustment for the height of the cutting.

## CONSTRUCTION AND OPERATION

The base of the machine, mounted upon four truck wheels, is a steel casting with finished top surface. On this base the operating portion of the machine moves, and by it is guided and controlled.

The bed of the operating portion is of steel casting, with vertical steel casting guides for the adjustable cutting element, and carrying also the secondary motor and mechanism for feeding and auxiliary functions.

In each of the four vertical guides for the cutting element is a rack, into which meshes a pinion by which the elevation of the cutter arm is adjusted and determined.

At the front the machine base carries a V-shaped slot, with steel sides properly curved for guiding the forward end of the machine so as to make the straight face-cut across the room, the swing being effected by a spur pinion in mesh with the circular rack at the rear of the base.

In traveling into a room the cutter arm extends forward. The machine advances until the arm is close to the face, as shown in the first position, Fig. 3. The lever-and-quadrant brake is then set and a telescoping

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anchor-drill rod is adjusted, extending forward to the face. The drill is driven by the secondary motor, and the anchor hole is quickly cut in the face directly ahead of the machine.

The anchor being set, the wire rope from a drum on the rear of the machine is led ahead and attached, while at the same time the feed is thrown in to swing the cutter arm to the right-hand corner of the place. This brings the machine into position 2, Fig. 3.

The brake is then released and the feed thrown out. The wire rope drum is thrown in, and the sumping cut is made by drawing the machine forward on the track to a point corresponding to position 3, Fig. 3. Evidently the sumping makes a rib cut as straight as the track.

As the sumping is completed the drum drive is thrown out, the feed thrown in and the cutter arm starts its running cut across the room. The feed pin-

as the swing-cut is complete, thus making the entire cutting operation continuous—sumping, swinging and withdrawing.

In backing out, the machine reaches position 6, Fig. 3, leaving the cut at the lefthand rib as straight as at the right and giving a perfectly squared place 20 ft. wide, undercut to a depth of 7 ft.

Swinging the arm again to a central position, the machine is ready at once to travel to the next working place.

#### NARROW WORK AND ROOM TURNING

The operation is exactly the same in entry driving, except that the full swing of the machine is not util-

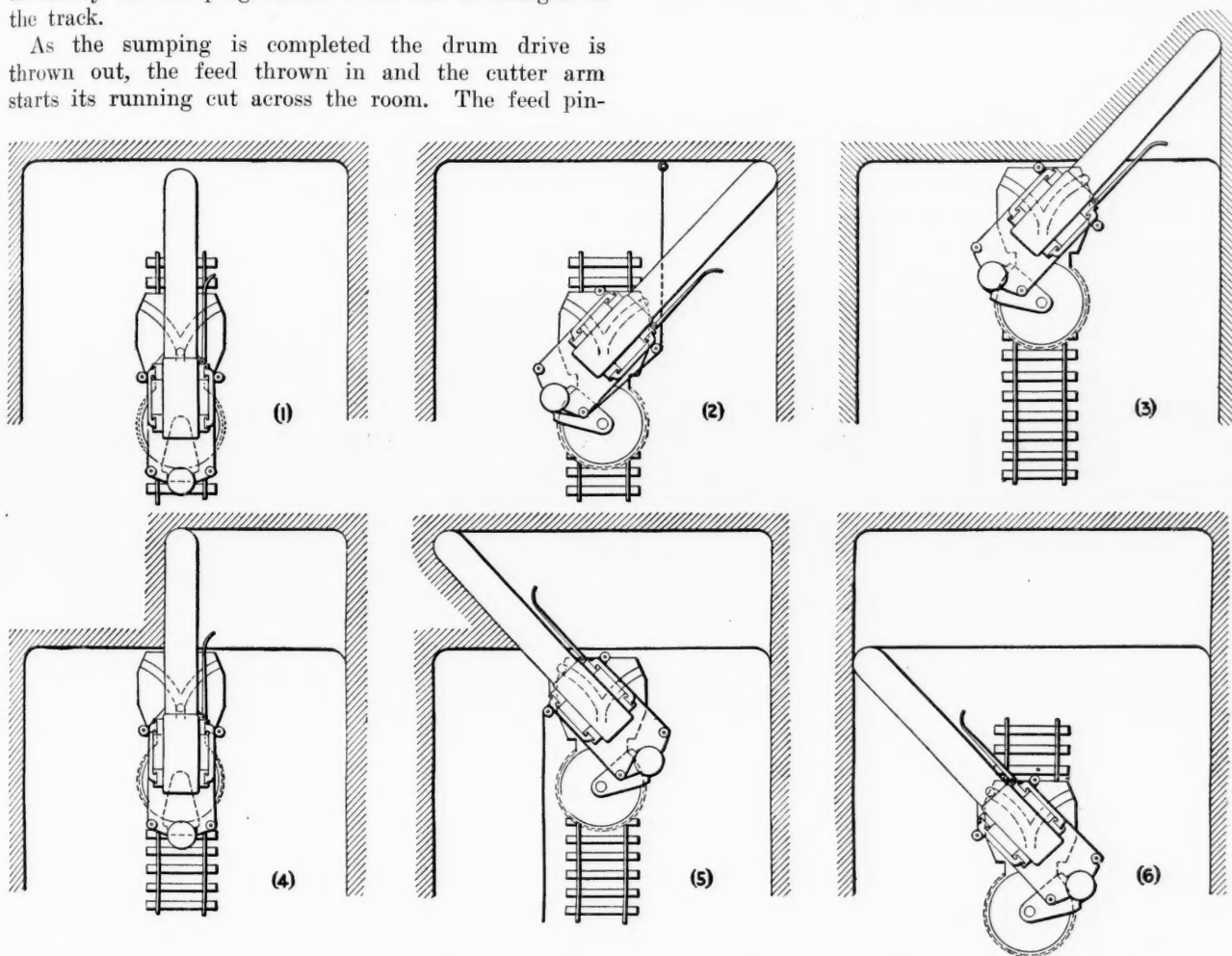


FIG. 3. SHOWING SIX PRINCIPAL POSITIONS ASSUMED BY THE MACHINE IN CUTTING A WORKING PLACE

ion, as it works around the circular rack, guided by the radius arm, acts in proper combination with the V-cam and roller in front to cause the cutter arm to withdraw until a central position is reached (position 4, Fig. 3) and then advance to the left (position 5, Fig. 3), so that the end of the arm follows a straight line across the room and thus cuts a straight and square face.

The drag of the bits in cutting holds the machine to the face, so while the cross-swing is being made the sumping rope may be shifted from the anchor ahead on the right to a jack behind on the left (position 5, Fig. 3), so that by throwing out the feed and throwing in the rope drum drive the backing out begins as soon

ized. An indicator shows always the width of swing to right or left from the center for all positions of the cutter-arm, enabling the runner readily and definitely to govern the width of his cutting. In a 12-ft. entry, for instance, he sumps with the indicator at 6 on the right and backs out with it at 6 on the left, or at any other right and left figures totaling 12 if his track is not in the center. He can widen at one side for a passing track by working full 10-ft. swing on one side and only the regular 6-ft. on the other.

Entries can be widened or slabbing done anywhere by continuous running cuts, the cutter-arm being swung to one side the proper distance and locked while the machine is drawn along the track by the wire rope.

Room turning is started by one or two short slabbing cuts, after which the room track curve brings the machine into position for operation in the usual way, driving the room neck as in any narrow work. Widening out the room is evidently an easy matter with this machine, by simply increasing the swing for successive cuts until the full width is reached.

The front cover shows some of the machines in use by the Main Island Creek Coal Co., at Omar, W. Va.

The main motor on this machine, besides driving the cutter chain, operates also the pinion shafts for raising and lowering the cutting element. The arrangement is such that the arm is raised or lowered only while the chain is running. This not only prevents untimely use of the elevating drive, but also insures its operation along with the cutting, enabling the chain to cut its way gradually upward or downward, thus following any desired line of cutting.

All other operations of the machine, such as the drilling for the face anchor, the rope winding for sumping and backing out, the feed on the cut across the face, and the propulsion from place to place, are effected by the secondary motor. The secondary motor is of the crane type, series wound, and gives the variable speed desirable for automatic adjustment to suit the conditions of the cutting, drilling or traveling. For the feed drive this is of special importance, because it enables realization of ideal conditions in cutting—a uniform speed for the chain and a variable speed to allow slower advance through hard places. The same advantage applies to the operation of the drill, the wire rope and the propelling mechanism.

This is not a turret machine. It does not swing about a fixed center, with a comparatively short radius of application for the turning forces. Fig. 3 shows that the cutting element operates as a lever of nearly equal arms. The "work arm" is the overhung length of the cutter-bar; the "power arm" is the distance from the cam roller at the front of the moving frame to the pinion at the rear. There is therefore a long leverage at all times for forcing the cutter arm to its work.

Automatic stops are provided for limiting the swing to any desired point on either side. Either stop may be raised to permit farther swing, and in such farther swing no harm can result from failure to stop the feed by hand, as the feed pinion simply runs off the end of the circular rack and continues idly turning until the drive is thrown out or the power interrupted.

A trolley pole is regularly supplied for use on haulage locomotive entries. The machine runner rides on a small platform at the rear, on which also are mounted the brake lever and quadrant. He here has full control of the machine movement, just as has the motorman of a haulage or gathering locomotive.

The cable reel for delivery of current to the machine for traveling and operation in rooms is carried upon a separate two-wheeled trailer truck, which pays the cable out freely in entering the room and winds it in automatically as the machine comes out.

In hard cutting it may sometimes be necessary to use the brackets at the sides of the base, just over the forward wheels, for setting jacks to the roof to hold the machine firmly to the track. These jacks are needed but seldom as the weight of the machine and its steady, powerful action render such special devices unnecessary.

### Extracts from a Superintendent's Diary

A delegation of ladies from the city paid me a visit today. They are canvassing the state in the interest of a proposed child-labor law. I had been expecting them for some time, having heard of their campaign from some of the superintendents who had already been honored.

Being naturally rather timid in the presence of strange ladies, I decided to take advantage of the warning I had received and commit a few arguments to memory, hoping thereby to be able to deliver them effectively in spite of all embarrassment.

It was a waste of good time; they came to deliver arguments and ideas and not to receive them.

The chief spokeswoman began about as follows: "We realize, Mr. Stewart," (Stewart is the name of the superintendent at one of the other mines owned by our company, but I did not correct the ladies, fearing that their talk might seem less personal after such a correction) "that you are only a representative of this monster corporation, and we don't want you to become offended at any insinuations we make against it, because we know that you must follow instructions, no matter how much they may outrage your ideas of justice. But we feel that because the owners of your corporation cannot be approached in person you ought to pass on to them our ideas and in turn insist that they issue instructions to you that will permit you to take a prominent part in this fight."

Think of it! Here they were telling me that I must believe as they did or be ranked in the same class as my terrible absentee owners and directors.

Realizing the futility of trying to justify my own opinions or the acts of my directors in the face of such prejudice, I silently manifested great interest in their arguments and allowed them to continue. Truth is, some of their opinions were so ridiculous that I became very much amused at their conversation.

After they had relieved themselves of all of their set speeches and were preparing to depart, I suggested that they lay aside the burden of the campaign for an hour or so and take a look at the men of our camp. It happened to be payday, and our men had all quit work at noon and were waiting for the paymaster to arrive.

I remarked to the ladies that they might interview some of the men and boys and get their ideas about child labor, but this suggestion did not meet with their approval. "Workingmen have no opinions on such matters that are worth considering," remarked one of the ladies. "They always have to be educated up to such progress, and as a rule, in the beginning, they always oppose legislation intended for their betterment and protection."

That remark was worthy of being classed as argumentative to say the least, so I took courage and made another effort: "But surely grown men can offer evidence as to whether they are being treated as human beings or being made mere slaves by employers who live thousands of miles away from them and for that reason can have no sympathetic interest in their doings." That from me.

This from them: "Mr. Stewart, one of your labor leaders addressed our club for two hours last week, and as he intimated that he would rather not have us make his talk public because his job might be in danger we probably know more of your men's feelings than you do."

I made no further effort to delay their departure.

## Death of F. C. Keighley

Frederick Charles Keighley, a resident of Uniontown, Penn., and general superintendent of the coke operations of the Oliver & Snyder Steel Co., was found dead in his garage Wednesday evening, Apr. 14, at about 6 p.m., by his son, Henry Keighley. He was the victim of a self-inflicted wound, the shot having entered his mouth and emerged from the top of his head. When discovered he was lying on the floor in a pool of blood.

The bullet which caused the coke man's death is believed to have been fired at about 10 a.m. The deceased spent the early part of the morning at his office in Oliver, and it was noticed by his associates that he was somewhat nervous and excited. He left at 9 a.m. and went to his home, handed some papers to a daughter and left the house without removing his overcoat. It is believed that he immediately went to the garage.



FREDERICK C. KEIGHLEY

It is said that Mr. Keighley had been despondent for some time, owing partly to the illness of his daughter, Mrs. William A. Hogg, who is a patient in a Pittsburgh hospital; but the actual motive is thought to have been financial worries incident to the closing of the First National Bank of Uniontown, Penn.

Following the report of the tragedy and the issuance of a newspaper extra with the sad tidings, the home of Mr. Keighley was besieged by sorrowing friends. So great was the number arriving at the home that police officers were detailed to the residence, and only a few intimate friends of the family were admitted.

For a number of years Mr. Keighley has been a member of the Board of Education, and until last year he officiated as president. In politics he was a Republican, being influential in the counsels of his party.

For many generations the Keighleys have been prominent in England, their home being in Yorkshire. There Jeremiah Keighley, a wool-buyer, lived and died in the

city of Leeds. His youngest son, Charles Keighley, was the father of the Oliver superintendent. He was a jobber in dressgoods in his native country, but when he came to the United States in 1865 he became chief bookkeeper for the Mahoning Coal Co., at Youngstown, Ohio.

Ten years before his father came to America, F. C. Keighley was born at Victoria Terrace, Keighley, Yorkshire, May 5, 1855. He attended school in England and on arriving in America studied for one year in the public schools of Youngstown, Ohio. After this brief preparation he began work, securing a position as office-boy under his father's supervision. Strict attention to his duties led to his promotion until he became his father's assistant.

After gaining an insight into the business methods of the company, young Keighley began work with the engineering corps. He was shortly promoted to the superintendency of one of the mines of the Mahoning Coal Co., and for four years preceding 1880 was manager of two of the company's stores.

On Sept. 15, 1880, Mr. Keighley arrived in Fayette County as manager of a store operated by the Youngstown Coal Co. After six months' meritorious work he was promoted to the superintendency of the plant. His father followed him 11 years later, becoming store manager for the Youngstown Coal Co.

Later he began to operate coal mines on his own account at Toms Run, Allegheny County, Penn. He operated a mine there for 18 months, sold it out and returned to Uniontown as general manager of the Youngstown Coal Co.'s operations, holding that position for two years.

Fred Keighley was superintendent of the Mammoth plant of the H. C. Frick Coke Co. for a short time, and then in 1891 he became identified with the Oliver & Snyder interests. He assisted in the erection of the Oliver coke plants north of Uniontown, and in 1897 was made general superintendent of the coke operations of the three large plants.

He was held in high esteem among the men engaged in the mining of coal and the manufacture of coke in this section, and his advice was not infrequently sought by some of the most prominent coke producers when solving the problems of their business. With the men at his mines and coke works, Mr. Keighley was very popular. He was regarded as one of the most likable men in the coke region.

Not only in Fayette County, where he was intimately known by thousands, but throughout the entire country wherever coal is mined, Fred Keighley was a prominent figure. For six years he was president of the Coal Mining Institute of America, and for two years previous to the appointment as superintendent of the Mammoth plant of the Frick company he was the state mine inspector of the Fifth bituminous district, filling the position now held by Inspector I. G. Roby.

Mr. Keighley was a trustee of the Methodist Episcopal church of Uniontown and also a member of the Elks. His handsome residence on East Fayette St., Uniontown, was erected in 1904. He was married to Miss Lucy J. Burnett, daughter of James Burnett, a former contractor and builder of Trumbull County, Ohio, on June 1, 1876. His wife and the following children survive him: Mary Grace Keighley, Mrs. Florence Hogg, widow of the late William A. Hogg, Thomas, Charles, Rose, Henry and James Keighley.



# Importance of Safety Inspection by Company Inspectors\*

BY J. W. GROVES†

*SYNOPSIS—State inspection is usually inadequate and limited by the provisions of the mining law. The author urges that private inspection is not only ethical, but economical.*

We consider that project successful which accomplishes the object for which it was established. The statistics of the companies which have adopted safety inspection prove beyond a doubt that the measure is successful as it reduces both the number of accidents and their harmful effects. During the past eight years nearly all the large coal companies and many of the smaller ones and many corporations engaged in other lines of work have employed inspectors whose duties are to report upon all dangerous conditions and to suggest safety measures.

## STATE INSPECTION INADEQUATE, LIMITED AND APT TO APPEAR UNFRIENDLY

They have found that the inspectors, appointed and paid by the state, cannot visit the mines with the necessary frequency, are primarily interested in the enforcement of the state mining law and have time insufficient for a detailed inspection such as a private inspector is required to make. The state inspectors are not in the same friendly relation to the corporations as is a company inspector, and they do not feel free to make suggestions that are outside the law. The company inspector should, and usually does, have the authority to require miners or laborers about the mine to leave other work and assist in making places safe.

Some mining-men contend that an inspection, especially of bad roof, does but little good unless the inspector remains at the point of danger until the risk is removed. It is true that in many cases the miner, instructed to timber his place, will not do so or will put off this duty until a more convenient time. Such a delay often proves disastrous.

Foreign miners are more given to taking chances than Americans. They either do not understand the instructions or do not wish to spend time doing anything that is not directly concerned in the making of money. Possibly also the greater number of bosses in foreign mines has led aliens to believe that they will receive a second or third warning before anything happens. I believe that it should be left to the inspector to decide whether he can depend upon the miner or not and whether it is his duty to stay and see that the danger is removed or to go on and spend his time more profitably in discovering new dangers.

## INSPECTION HAS REDUCED THE FREQUENCY OF ACCIDENTS

The fact that many of the companies have adopted inspection is a testimony to its importance. Because of the safety movement insurance companies now consider min-

ing less hazardous and are planning to readjust their long-established mortality tables.

Inspection has greatly reduced the accidents, both fatal and nonfatal. For a while, after rigid inspection and accounting were established, the nonfatal accidents seemed to increase. This was due to the fact that many minor injuries now reported were formerly not regarded as reportable accidents.

In those days when a man pinched his finger or knocked off a piece of skin he tied it up with a piece of cloth torn from the lining of his coat and said nothing about it. No one then knew he had been hurt except his family, unless the slight injury developed into something more serious. Nowadays such an accident must be reported and counted in the total, and it has its effect on the averages. The apparent increase in accidents was due to such cases, but so great has been the improvement in conditions that now less accidents are recorded than appeared in the old and unreliable reports.

A reliable account of fatal accidents has, however, been kept by the state inspectors for years, and with their figures as a basis it is clear that the number of fatalities has steadily decreased.

## INSPECTORS AID SAFETY AS MUCH BY THEIR PRESENCE AS BY THEIR ACTION

The inspector is a periodical reminder of safety, or possibly I should say of danger. He is like the warning-board at a railroad crossing or the big red signal of danger. I am told that some mine foremen "see red" every time he comes about the mine. The miner will "stop, look and listen." He stops only for a short time, and then hurries away to put his caps in their appropriate hiding-place, to examine his powder-box and to place his carbide a sufficient distance from his explosives. This spasmodic effort at safety will soon beget a habit which will continue to grow and will insure the permanency of the safety movement.

Safety inspection, of course, receives its primary sanction from its humanitarian aspect. There are thousands of people yearly saved from suffering cuts and broken bones; there are women and children protected from becoming widows and orphans, from sorrow and poverty. Many of these are subject to a risk they do not realize and cannot prevent. Who is there that will say it is not the business of a company to protect these people when it can be accomplished with a reasonable amount of safety inspection?

## FINANCIAL JUSTIFICATION OF SAFETY INSPECTION

But most important is the business side of inspection—its cost and its profits. I call it important because it is the one factor that will keep the work alive and make all the other advantages possible. We are accustomed to consider inspection as an expense with nothing to balance it on the credit side of the ledger. It must, I suppose, continue to be so, for it is most difficult to place an actual cash value on inspection. The work never shows a bal-

\*Paper read before the Alabama Safety Association at Birmingham, Ala., Mar. 13.

†Lecturer, Tennessee Coal, Iron & R.R. Co.

ance on the credit side of the account. We consider it generally as an expenditure equal to the salary and expenses of the inspector, and this is charged against the cost of coal.

The fact that the inspector prevents wrecks on the haulage-road, the caving of rooms and the loss of coal and that he occasionally saves a life valued at \$5000 or a mule at \$150 are all operating advantages. If we would only be fair to inspection and give it credit for a portion of these things we would find that it is most profitable.

There are a number of states that have compensation laws whereby injuries and the loss of life are paid for at fixed prices, and in these states inspection is becoming a regular part of business. "Safety First" is urged and promoted in such commonwealths in all possible ways.

This law operates to prevent old men and children from getting employment. It is to the advantage of a company to keep out of its employ those who are most likely to be injured. This may work a hardship on some people, but in general will accomplish much good. Companies are requiring their employees to retire at a certain age and are lowering the age limit at which they employ men and raising that at which they will employ children. This self-protection, moreover, is making companies more careful to prevent intoxicated men from going to work.

But the inspector does not economize solely by saving human life. He may also by suggesting some device occasionally save a wreck which would, even if no one was hurt, cause a delay of a few hours and a reduced tonnage. The saving of cars from breakage by this provision may effect an economy of many dollars. The safety inspector

may even prevent a mine explosion, but if he does no one will ever know it; but that does not alter the fact that his one act may mean prosperity or bankruptcy for his company.

The man who can accomplish results as a safety inspector should be capable of superintending the operation, must understand efficiency and have both a theoretical and a practical knowledge of the work; for only by having the respect of the employees can he get results.

The Alabama Safety Association should, I believe, encourage all employers of a large number of men to put on an inspector, showing them, wherever it is possible, that it is to their financial advantage to employ such a man. The argument of economy appeals to everyone, and so the cynical expression, "We can hire as many men as we wish, but mules cost money," is not so pertinent as it once was.

Inspection is not to be urged alone because it is right, but because it constitutes good business.

✽

### Spain Now Admits Coal Free

A royal decree of April 7, 1915, says *Commerce Reports*, suspends until further notice the import duty and transportation tax on coal, the exemption to apply to all shipments made to a Spanish port on or after the above date. The combined import duty and transportation tax on coal imported from the United States amounted to \$1.06 per metric ton (2204.6 lb.). The Director General of the Spanish Customs Department has requested quotations of current prices for coal shipped f.o.b. and c.i.f. from the United States to Spain.



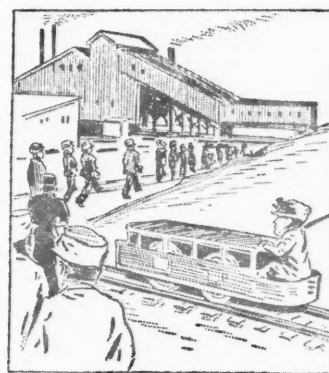
*They Fight to Maim  
and Kill*

The men who fight in Europe—they fight to maim and kill,  
They heap the dead in windrows with cold and cruel skill,  
They fight to wreak destruction, to lay a country bare,  
And death, disease and famine are with them everywhere,  
With guns and belching cannon they drive the people forth  
To face the raging winter that sweeps from out the North,  
The men who fight in Europe with deadly ruthlessness  
Have filled the world with terror and sorrow and distress!

## The Nobler Army

By BERTON BRALEY

Written Expressly for  
COAL AGE.



*We Fight the Bloodless  
Battles*

The men who fight in Europe—they fight to lay men low;  
WE fight with drill and powder, and nature is our foe,  
We fight against the darkness, the secret deeps of earth,  
To win the buried treasure of which we know the worth;  
We fight that men may labor and love and live and dream  
Amid the modern magic of iron and of steam,  
And all the loot we capture the hosts of toil shall burn  
To foil the winds of winter and make the engines turn.

The men who fight in Europe—they fight with courage bold  
To make a people hungry and suffering and cold;  
We fight to warm the hearthstone, to turn the wheels of trade,  
To utilize the riches that God himself has made;  
Our army digs its trenches that comfort may increase,  
We fight the bloodless battles of industry and peace,  
We fight for life and happiness—and not for death and dole,  
This army that goes underground to mine the gleaming coal!

# Extraction of Oil from Coal

BY F. R. WADLEIGH\*

**SYNOPSIS**—A brief history of the development of the distillation of oil and tarry products from coal. Typical analyses and yield of cannel coals. Estimated yield and cost of the Del Monte process. Brief outline of method employed. Advantage of low-temperature distillation. A Wyoming proposition—analysis of the coal and estimated yield. Other coals in this country.

The question of extracting oil from coal has been attracting much attention recently in England, owing to the largely increased consumption of fuel oil by the British Admiralty and the growing demand for motor spirits.

## EARLY HISTORY AND DEVELOPMENT

The distillation of mineral oil from the Scotch shales, Boghead cannel and Torbanehill mineral—the latter being originally found in Linlithgowshire, Scotland—has been going on for many years. The first mention of the manufacture of pitch, tar and oil from coal and shale was in 1681. It had become an established industry in Shropshire in 1711. Later experiments made at Bristol in 1779 by the owners of a lampblack factory, on the oil produced from coal at their plant, showed that by boiling this oil it could be reduced to the consistency of tar or pitch. In 1816 mention is made in Holmes' "Treatise on the Coal Mines" of a manufactory at Sunderland for extracting tar, petroleum and ammonia from coal.

The origin of the modern mineral-oil-distillation industry now carried on in Scotland was due to James Young, a chemist of Manchester, who died in 1883. In 1847 Mr. Young began his experiments with the oil obtained from a petroleum spring at Alfreton, in Derbyshire. From this he distilled a light thin-burning oil as well as a thicker lubricating oil. After this supply failed, Mr. Young noticed drops of petroleum coming from the sandstone roof of a coal mine; and supposing that this came from the action of heat on the coal seam, he succeeded after many experiments in obtaining a substance resembling petroleum, by distilling the coal at a low red heat. This substance treated in the same way as natural petroleum gave similar products—chiefly oils and paraffin.

As this process became known, numerous factories were started up, both in Great Britain and the United States. Cannel coal and Boghead coal were used, quantities of it being sent to the United States, where in 1860, according to statistics, there were about 70 factories for extracting oil from coal and other mineral sources, as bituminous shales, etc.

## SOURCE OF OIL IN COAL AND SHALES

Cannel coals, boghead coals (called also "torbanites") and various bituminous shales have been the main sources of oil production. Torbanites were first worked at Torbanehill, whence the name is derived. They do not look like ordinary coal, but in 1853 the English courts decided that they were coal. In Germany and France, however, they are not classed as coal.

\*Mining engineer, Philadelphia, Penn.

The formation of boghead cannel is now considered to be due to the presence of a large proportion of resinous bodies in the original beds of vegetation, such as lycopodia spores, which, subjected to high temperatures, became more or less liquid and, mixing with the surrounding earth deposits, gave rise to the boghead cannel, having the same organic composition but a high percentage of ash—over 30 per cent. The hydrogen content is high, as is also the yield of volatile hydrocarbons. A typical analysis is as follows:

	Per Cent.		Per Cent.
Carbon .....	78.10	Fixed carbon.....	12.20
Hydrogen .....	10.43	Volatile hydrocarbons..	87.80
Oxygen .....	11.47		100.00
	100.00		

The shales now used in the distillation process, instead of being (like coal) a compound of carbon and hydrocarbons, contain hydrocarbons with mineral or earthy matter, so that they do not coke when heated to redness, but leave from 70 to 80 per cent. of mineral residue. With the exception of the tar oils obtained at gasworks and byproduct coke ovens, the shale oils are the only source of production of high-grade fuel oils in Great Britain. The yield varies from 18 to 40 gal. of crude oil per ton of shale, the average being about 23 gal.

In 1909, 3,000,000 tons of shales, etc., was treated in Great Britain, giving a commercial production of 68,000,000 gal. of crude oil, which yielded by further treatment the following products:

Naphtha .....	4,000,000 gal.
Lamp oil.....	22,000,000 gal.
Gas oil.....	40,000 tons
Lubricating oil.....	40,000 tons
Sulphate of ammonium.....	60,000 tons

From the intermediate oils was extracted 25,000 tons of paraffin wax.

## DETAILS OF A PROJECTED PLANT

Following are the important details of a recently projected plant designed to handle 500 tons of cannel coal per day by the Del Monte process, the object being the production of oil and motor spirit:

The chief product obtained will be crude oil, which on being further treated will yield motor spirit, fuel oil, paraffin wax, pitch, etc., in varying proportions, as well as sulphate of ammonium. The cannel coal to be used is not of high grade and is said to be unsuited for other use, being more on the order of Torbanehill mineral, which carries about 10 per cent. of hydrogen. Experimental results have shown that a ton of this cannel will yield 58.5 gal. of crude oil and 54.5 lb. of sulphate of ammonium, together with 58,000 cu.ft. of producer gas.

The total cost of production, including distillation, refining, cracking\*, etc., is given as \$4.31 per ton of cannel, showing an estimated net profit of \$3.04 per ton. The yield on 500 tons will be as follows:

Motor spirit.....	17.4 gal.	Pitch .....	51.0 lb.
Heavy fuel oil.....	17.6 gal.	Sulphate of ammo-	
Paraffin wax.....	37.5 lb.	nium .....	54.5 lb.

\*The term "cracking," which is said to have originated in the old Pennsylvania refineries some 50 years ago, means a partial alteration of the oil treated, as distinguished from the more complete decomposition that would disrupt the molecules largely into carbon and permanent gas. The "cracking" simply alters the molecule in a way that cannot be done by simple distillation, and may or may not be accompanied by any considerable production of permanent gas, the product being largely a liquid condensate, though of very different character from that obtained by simple distillation.



## DESIGN OF THE DEL MONTE PROCESS

The Del Monte process mentioned above is a new one, designed to effect the carbonization of the coal at a low temperature, say from 900 to 1300 deg. F. The retort in which the coal is carbonized consists of a number of mild-steel tubes slightly inclined, the coal being fed in at the lower end and carried up the tubes by an Archimedean screw. Through the middle of the screw is run a tube, and into the upper end of this tube air and gases are injected and burnt. At the same time the exterior of the tube is heated by a series of gas burners, which heat the coal on all sides.

The temperature is so regulated that it is raised from the lower end to just beyond the middle and drops again at the top of the tubes. In operation, a stream of cold gas is forced in at the upper end of each tube and passes through to the lower end. This air current carries off the hydrocarbons liberated by distillation and takes them to the cooler part of the retort where they are condensed.

The advantage claimed for this method is that the yield of hydrocarbons is increased, because they are not subjected to a high temperature that would break them down. The use of low temperatures reduces materially the output of gas from the coal, but largely increases the yield of tar oil, the latter being of good quality, much resembling petroleum. The coke is quite as good as ordinary gashouse coke and suitable for all ordinary purposes. The gas obtained is said to be more than enough for firing the retorts and for the operation of the plant.

## A DEL MONTE PLANT IN ENGLAND

At Chiswick, near London, a Del Monte plant has been operating continuously on a commercial scale since Jan. 1; it was specially designed for the treatment of cannel coal and is yielding 130 gal. of oil per ton. Steps are being taken to give the coal operators of this country an opportunity to investigate this process, which may show them a way of utilizing slack and other low-grade fuels. The remarkable results attained in England certainly suggest future possibilities, and coal-mine owners should take up the matter, as they are the ones most vitally interested. There is no question but there are ample supplies of coal in this country suitable for low-temperature distillation that would give large yields of tar oils, as well as sulphate of ammonium.

## PROPOSED TREATMENT IN WYOMING

In 1907-08 a coal company in Wyoming, operating in Uinta County, announced its plan for the operation of a plant for extracting oils from their coal. The chemist reported that the value of the oils that could be extracted was about ten times as great as the value of the slack coal; he also reported that there was a residuum after the oils were extracted that had considerable fuel value and could be briquetted, using the pitch extracted from the coal as a binder. This coal had the following analysis:

	Per Cent.		Per Cent.
Moisture .....	15.24	Ash .....	2.91
Volatile matter .....	37.46		
Fixed carbon .....	44.39		100.00

The coal contained 0.53 per cent. of sulphur and had a calorific value of 12,084 B.t.u. when air dried. The nitrogen content was 1.34 per cent., and the experimental yield of ammonium sulphate was 26 lb. per ton, while the entire coal-tar product was 220 lb. per ton, the latter being unusually high. I have no knowledge, however,

whether this plant is now or ever was in operation on a commercial basis. The above data were taken from a report made by Mr. Peterson, of the Agricultural College of Utah, July, 1908.

## COALS AVAILABLE FOR EXTRACTION OF OIL

There are cannel coals in West Virginia and Kentucky with from 43 to over 50 per cent. of volatile matter and as high as 8 per cent. of hydrogen. There are also coals in this country with a high nitrogen content that would give large amounts of ammonia. Of all coals in this country, probably some of those in Pierce County, Washington, have the highest nitrogen content, many analyses showing over 2 per cent. and some as high as 2.65. The New River coals average about 1.52 per cent. and Pocahontas coals about 1.14 per cent., while some of the coals of the Pittsburgh bed run as high as 1.80 per cent. of nitrogen.

Today the cost of mining these coals is high and the market so limited that they are not being developed to any extent. Their future development may lie in the extraction of oils and byproducts by low-temperature distillation. The Mond process, used largely abroad, yields from 80 to 90 lb. of sulphate of ammonium per ton besides the tar and gas, from ordinary coal having about 1.4 per cent. of nitrogen. Both the Solvay Process Co. and the Pennsy Salt Co. had and probably still have plants of this kind in operation, where producer gas was the prime object and the ammonium sulphate and tar only byproducts. One of the large operating companies in the Pittsburgh, Penn., field is now experimenting along the same lines and has erected a complete plant, using the Mond process, with a modification designed by their own engineer.

In a paper published in the May, 1914, *Journal* of the Franklin Institute, L. C. Jones, of the Solvay Process Co., Syracuse, N. Y., gave some results of experiments made on the low-temperature distillation of coals, for the purpose of determining the nature of the products that could be obtained. These experiments, however, are said to be as yet incomplete. Mr. Jones makes the following suggestive statement:

"At any rate, such slow artificial carbonization is strikingly suggestive of Nature's process. These residues show a decided resemblance to the natural product. That they are not identical, both physically and chemically, may be due to the high pressure used in nature, which we have made no effort to duplicate."



## Course in Coal Mining for Illinois Employees

The Illinois Miners' and Mechanics' Institute, coöperating with the Department of Mining Engineering of the University of Illinois, will offer a short course in coal mining at Urbana, Ill., from June 7 to July 17, 1915. The same subjects will be studied during the short course as are taken up in the regular schedule of the two-year course, four hours each morning being spent in lectures and discussions and three hours in the afternoon devoted to courses in the mining laboratory, electrical laboratory, drafting-room, surveying on the campus and in first-aid work at the University Mine Rescue Station.

There is no charge for enrollment or tuition, and no textbooks are required other than those furnished free by the institutes.

# Economic and Moral Phases of Safety First\*

BY MILTON H. FIES†

*SYNOPSIS—Several instances are cited where safety work has largely reduced accidents, fatal and nonfatal. The author shows the effect of safety propaganda on the relations between employer and employee and urges that all work for safety is incomplete so long as it is not accompanied by a movement against alcoholism.*

The value and importance of the Safety-First movement—the greatest social advance of our age—no more need proof than the geometrical axiom that a line is the shortest distance between two points. A few years ago the safety movement might have been regarded as a fad; today it is known to be an economy—even more, it is the very foundation of efficient management. The majority of us in Alabama may have been slow to realize the value of this movement; but we are fast beginning to know that safety means humanity, conservation, industrial peace, co-operation and business economy.

Years ago, at the mine we placed output of coal before conservation of life. Railroads were putting dollars first and men second and were mindful of maintenance-of-way, but forgetful of maintenance of men. Steel plants were "making steel and killing men." To quote President Wilson:

We have squandered a great part of what we might have used; we have not stopped thoughtfully enough to count the human cost—the cost of lives snuffed out, of energies overtaxed and broken, the fearful physical and spiritual cost to the men and women and children upon whom the dead weight and burden of it all has fallen pitilessly the years through.

In the brief time allotted to me I shall discuss only the economic and the moral, or humanitarian, phase, which latter is the most important phase of all.

## RAILROAD SUCCESSES IN SAFETY PROPAGANDA

It has been conservatively estimated that the yearly loss in America from disability to workingmen is \$250,000,000. Practically all this loss could be avoided. It is a debit due to ignorance and carelessness.

The results obtained from well-organized and concerted safety movements may be illustrated by the following examples: In the first year of its safety work the Chicago & North Western R.R. Co. reduced its deaths from injuries 35 per cent. and its nonfatal accidents 25 per cent. The St. Louis & San Francisco R.R. (the "Frisco" line) in 11 months reduced the deaths on its road 33 per cent. and other injuries 22 per cent.

During the year 1913 the freight and passenger locomotives of the Southern Pacific Co. ran 59,738,000 miles, a distance equivalent to an encircling of the globe every 3½ hours. Nevertheless 41,783,000 passengers were carried an aggregate distance of 1,756,482,000 miles without a single fatality resulting from a train accident. The Harriman memorial gold medal was awarded to the New York Central & Hudson River R.R., in competition with all other great systems, by a committee appointed by the

American Museum of Safety. The award was made because in the year ending June 30, 1914, that road, which operated 3,000,000 freight and passenger trains, killed 102 and injured 1063 fewer persons than in the preceding year. This improved record resulted from its safety propaganda. During the year ending Dec. 31, 1914, this great railroad system reduced its fatalities 32 per cent. and its injuries 33 per cent. as compared with the previous calendar year.

## STEEL MILLS REDUCE LOSSES

The results obtained by one of the pioneers in safety work, the United States Steel Corporation, is also remarkable. The most effective work done by any of its subsidiaries was that at the South Chicago plant of the Illinois Steel Co. Even after 1906, the year when the corporation set about establishing universal safeguards and the safety spirit, it was and still remains the leader in safety work in the steel industry. It has reduced its record of injuries 66⅔ per cent. and lowered the number of deaths from 46 until there were only 6 in 1912 and 9 in 1913, 3 of which resulted from heat prostration.

## PROGRESS IN MINE SAFETY

In the coal-mining industry the value of concerted and systematic work is proof of its value. Statistics compiled by the U. S. Bureau of Mines for the period between January and October, 1914, show a reduction of 389 fatalities as compared to the same period in 1913. While these figures are gratifying, there still remains much to be accomplished; and in no other occupation is there greater opportunity for effective safety work than in coal mining.

In the West the excellent safety organization of the Colorado Fuel & Iron Co. has enabled it to attain a fatality rate far lower than that of the rest of the state. In 1911 at the coal mines of the Colorado Fuel & Iron Co. there were 19 fatal accidents as against 72 for the balance of the state. In that year the company mined 172,947 tons per fatal accident as against 96,002 in the other coal mines of the state. In 1912 the company had 17 fatal accidents as against 81 in the rest of the state and mined 206,830 tons per fatal accident as against 92,604 for the balance of the state.

## SAFETY FIRST, QUALITY SECOND AND COST THIRD

It is gratifying to know that in 1911, after the Bureau of Mines had become well organized, a reduction of 43 per cent. was made in that class of accidents in which over two men were killed. All efficiently managed corporations realize the value and necessity of "safety first." The H. C. Frick Coke Co. has adopted with decision an uncompromising policy of safety first, quality second and cost third.

I regret that limited time forbids my going into detail as to results obtained by the National Cash Register Co., International Harvester Co., United States Shoe Manufacturing Co. and other progressive business concerns in their commendable efforts to preserve the life and limb of their employees. I have no figures as to results

\*Paper read before the Alabama Safety Association at Birmingham, Ala., Mar. 13.

†Superintendent Gipsy mines, Maryland Coal Co., Gipsy, Ala.

obtained by the Tennessee Coal, Iron & R.R. Co., but its broad-minded efforts, system and efficiency in safety work are a matter of general knowledge, and the officials deserve the praise and gratitude of the entire community.

#### MORAL PHASE OF "SAFETY FIRST"

The attitude of employer to employee is of great importance in the United States, as it is a land of democratic traditions and equal privileges. The success of our government is only possible when employer and employee are in harmony. To my mind one of the largest factors toward the solution of this problem is the Safety-First movement. By his interest in it the employer gives evidence of the fact that he is paternal rather than predatory.

Many accidents occur indirectly from the employer's lack of human interest in the employee. Any one who has made a careful study of the characteristics of the workman knows that he appreciates sympathy and kindness. I believe that the indifference of many men toward their own safety is due to the fact that they feel that no one cares just what becomes of them. The boss' attitude of indifference toward the welfare of his men reacts, and soon the workman becomes discouraged and disheartened. The employee's attitude is immediately reflected in his work, and carelessness becomes his chief characteristic. Aply is such a man described:

The emptiness of ages in his face,  
And on his back the burden of the world.  
Who made him dead to rapture and despair,  
A thing that grieves not and that never hopes,  
Stolid and stunned, a brother to the ox?

#### LAYING OVERMUCH STRESS ON ONE UNGRATEFUL MAN

You may consider this aspect of the matter purely idealistic; you may insist that it is far-fetched; you may even argue that such a philanthropic attitude is not appreciated. I know that a man who practices this doctrine gets many a hard knock; that he often thinks, "What's the use?" that frequently those to whom he shows the greatest kindness often show the greatest resentment when they have occasion to resent. But I maintain such an attitude does not characterize all workmen, but only a small minority. A boss may be firm and still remain human. The principles of "safety first" are most effectively applied when an appeal is made to a man's reason and sentiment.

It is generally conceded that safety rules are usually resented by the employee. Especially is this true if they make him perform extra work or put him to some expense or make him deviate from certain of his own fixed rules or standards. This is more particularly the case in large corporations, where the relation between employer and employee is less friendly than in smaller business concerns. There is a reason for this lack of congeniality, and in my opinion it is due to the fact that the relation is impersonal.

#### THE "VERBOTEN" SIGN AND ITS CONSEQUENCES

Let us consider an example: At a conference of the management of a certain company a change in safety rules is to be inaugurated. The suggested changes affect the employee to his slight detriment, but nevertheless are necessary and right. The general manager writes a letter to the superintendent that on such and such a day such and such changes will be effective.

The superintendent usually copies the letter and posts it about the plant, but in some cases the foreman tells the

men that these new rules will be in force after a certain date. The employee never knows why such a change is necessary, and even if he does know the reason an explanation is due him.

#### SAFETY WITH SATISFACTION

Cold-hearted, impersonal, "red-tape" safety begets results occasionally, but it does not beget the happiest sort of safety; namely, safety with satisfaction. Superintendents and official heads of large corporations must get away from thoughtless impersonalism if they would successfully fulfill their mission.

The right sort of attitude of employer toward employee will eventually accomplish more in eliminating the prejudice of the public toward the employer than years of expensive publicity work or an insincere interest in applied sociology. In spite of a serious accusation to the contrary, I insist that a man may work for a corporation in an official capacity and still retain his honor and his self-respect.

#### BIG BUSINESS WILL SUPPRESS ALCOHOLISM

There is one other phase of the moral side of "safety first" to which I would call your attention. I have no interest in the political phase of this subject nor have I any desire to stir up discord. I only ask your consideration because the subject deserves thought. I refer to the relation of "safety first" to alcohol. I believe that the end that temperance fanatics have been unable to accomplish, that a political party has failed to secure, that even religion has been unable to bring about is shortly to come to pass—alcohol is going. Efficiency and safety demand it. Industry calls for it.

Science has shown us the true nature of alcohol; that it is responsible for insanity, imbecility, disease and degeneracy, and now comes "big business" showing us that it is to blame for most of our inefficiency.

#### ONLY A MINER IS PERMITTED TO DRINK

None of us would employ a timekeeper or a supply clerk or a cashier that drinks; we prohibit our store managers from drinking. But daily, here in Alabama, we permit men to go into our mines, carrying enough explosives to wreck them, whose hands are unsteady and brain befuddled as a result of a previous night's debauch. For such a man a danger-board has no meaning, nor does loose rock impress him. What does he care for his own safety or for that of others?

Let me bring the matter closer home. I have carefully studied the causes of the mine explosions in our state and have found that the incipient reasons of three explosions in Alabama, in which over 200 men lost their lives, may be traced to alcohol.

The railroads have long realized the necessity of taking a stand in this matter. Why should the coal or ore operator lag behind? With the last ten years, the idea was prevalent that a miner *must* have his whisky. There are scores of mine operators who still think this true and accept it as a principle. The coal operator must get away from this rule if he would successfully practice "safety first."

Thomas D. West, manager of a Cleveland steel foundry, writes in the *Survey* as follows:

The law says to our industries: "If a man in your employ loses his fingers, an eye or a limb, you or your insurance agencies are liable for heavy indemnity." Yet saloons are



licensed to be located next door to factories, to sell employees drink that will weaken their limbs, befuddle their intellects and thus render them liable to accidents that even the best safety appliances and watchfulness of superintendents cannot prevent. This outwitting of justice, commonsense and humanity, supported by laws, is responsible for many of the 2,000,000 injuries and 35,000 deaths that occur annually in American industries.

Wallace H. Rowe, president of the Pittsburgh Steel Co., which employs more than 5000 men, recently filed a petition with the judges of Westmoreland County, Pennsylvania, against the saloon. Mr. Rowe's petition declared that the high cost of living was made more burdensome upon the families of workingmen because 20 per cent. of the worker's earnings, on the average, go to the saloons. At the same time, he said, the cost of steel is increased by an overhead charge for accidents, 85 per cent. of which are due directly or indirectly to liquor.

#### RAILROADS CAN HAVE TEMPERATE MEN; WHY NOT COAL COMPANIES?

The Pennsylvania R.R. has 125,000 employees. But so rigidly is the "no drinking" rule enforced that few of them ever touch liquor. During the year 1913 the company's "spotters" made 784,675 "observations," but found only 158 men who were violating the rule against liquor. Surely when a great corporation like the Pennsylvania R.R. will make an average of six observations per year on each of 125,000 men it means to make an end of alcohol in its army of workers.

Most men concede that an effective workingmen's compensation law will soon be passed in every state in the Union, and I for one will welcome it in Alabama. The Safety-First movement is a step toward the preparation for this inevitable system, and in this preparation the saloon must go.

#### WHILE THE SALOON EXISTS THERE CAN BE NO SAFETY

Machinery may be guarded; safety devices may be installed; human ingenuity may be exerted to the utmost to guard the worker, and in spite of it all accidents continue. While the saloon exists there can be no safety. The campaign of the manufacturer or operator against alcohol is one for "safety first." Public opinion long ago drove the saloon from the church and the school, and it is not going to tolerate it as it directly causes the maiming and killing of men, thus putting a needless burden on industry, labor and the state.

I have laid particular stress on the moral or human phase of "safety first" because if we practice it with this idea in view economic results will follow. The human aspect of this question involves an issue of greater importance to corporations than any other; namely, its relation to the public. As one interested in a small corporation and as one who believes in the good which corporations can accomplish, I have no dread of socialism, but I do fear a public the judgment of which is influenced mainly by the relation of the corporation toward its employees.

Each executive employee of a corporation can become an effective force in combating this evil of a biased and prejudiced public opinion by being considerate in his attitude toward the workingman, by practicing "safety first" and by means of human kindness.

For the deeds men do together  
Are what saves the world today—  
By our common public work we stand or fall—  
And your fraction of the sin  
Of the office you are in  
Is the sin that's going to damn you after all.

## Safety Meets at the Panama-Pacific Exposition

It has been proposed by H. M. Wilson, the secretary-treasurer of the American Mine Safety Association, that the contestants at all state mine-rescue and first-aid meets pay an entrance fee of \$25 or thereabout, the proceeds to be expended for the benefit of the winning team, enabling it thereby to represent the state at the mine safety demonstration and third annual joint field meet of the Bureau of Mines and the American Mine Safety Association, Sept. 23-24, 1915, at San Francisco, Calif.

It is anticipated that this meet may be even larger than that held in Pittsburgh in 1911 in which a team from the state of Washington participated. State meets are already arranged to be held in May at Pineville, Ky.; McAlester, Okla.; Huntington, W. Va.; Billings, Mont.; Moberly, Mo.; Pittsburg, Kan.; Canton, Ill.; Birmingham, Ala.; Fort Smith, Ark., and Des Moines, Iowa. The preliminary program follows:

Sept. 23—10 a.m., mine-rescue demonstration; 2 p.m., first-aid demonstration; 4 p.m., coal-dust explosion.

Sept. 24—10 a.m., first-aid contest for interstate supremacy; 2 p.m., rescue contest for interstate supremacy; 4 p.m., rock-drilling contest; 8 p.m., award of prizes and souvenirs in the Convention Hall.

The following organizations will hold indoor conferences about the same time:

Sept. 17-18, American Institute of Mining Engineers; Sept. 20-22, American Mining Congress; Sept. 20-25, International Engineering Congress; Sept. 22, California state mine-rescue and first-aid contest; Sept. 27-30, National Safety Conference, under joint auspices of the National Safety Council and the California Industrial Accidents Commission (Sept. 28 to be devoted to mine-safety conference); Oct. 6, the World's Insurance Congress discussion on the relation of insurance to mine safety.



"THANK HEAVEN! IT'S OVER!"

## Need of Better Discipline in Mining\*

By F. G. MORRIS†

Recent statistics on coal-mining fatalities in the United States for the year 1914, compiled by the Bureau of Mines, show that 2451 lives were lost, or 334 less than in 1913.‡ Even though this reduction is encouraging, surely we cannot congratulate ourselves so long as so many as 2451 lives were lost. We shall doubtless find when the accident statistics of other coal-mining countries of the world for 1914 are secured that, as in former years, our fatalities have been greatly in excess of those in most countries.

We may reasonably ask, Why should our country suffer the loss of 2451 men, for we know that some other occupations and trades of a more hazardous nature suffer less loss of life per number of men employed and that England, Belgium, Germany and some other coal-mining countries which have more unfavorable natural conditions have a lower death-rate?

A thorough analysis of the nature and causes of all accidents fatal and nonfatal will show that at least 90 per cent. are preventable and only 10 per cent. might be classed as being beyond our power to prevent. The advantage of analyzing the causes of accidents and searching for a remedy is therefore most evident.

### SHOULD NOT BLAME THE LAW

We do not reason with justice when we place all the blame for our accidents on apparent defects or omissions in our statutory mining laws. We should rather lay the blame at our own door because we have failed to interpret the real intent of our mining laws and because we have not exercised the proper diligence in their enforcement nor made our employees follow the unwritten laws of the industry. The law clothes certain of us with written authority to discipline our subordinates; beyond that, our success in discipline lies in our initiative.

Too often the statement that an accident is due to the carelessness of an employee is thought to exonerate from blame everyone but the unfortunate victim. This is not true; the carelessness may well be due to the fact that the man had never been properly disciplined. He may have been similarly careless several times and his persistence in wrong methods have been overlooked. Finding that disobedience to rules of safety did not result in any personal inconvenience he continued his unsafe practice until finally it proved fatal or he was injured.

### CULPABILITY MAY BE INDIRECT, BUT RESPONSIBILITY IS CLEAR

Moreover, sometimes the accident arises from the fact that the foreman fails to examine a working-place, being satisfied with the assistant's investigation, which indeed may satisfy the law, but should not quiet the conscience. And the foreman is not always wholly to blame, for he may have too large a territory to supervise or too little

assistance. The superintendent may thus be, in part, the guilty party. "John Doe," the killed or injured workman, may have been careless; yet when that has been stated, it does not relieve all others of their responsibility.

Moreover, many men are careless because they do not know how to be careful. They have never been taught. In short, if we would reduce the fatality rate we must not accept the legal requirements as a measure of our accountability, but place the obligations of assuring safety on a high moral plane.

## Causes of Mine Fatalities in Pennsylvania in 1914

The following official tabulation of fatalities in the State of Pennsylvania during the year 1914 will be found of interest:

CAUSES OF FATALITIES INSIDE MINES AND PERCENTAGE FOR EACH CAUSE, BITUMINOUS REGION OF PENNSYLVANIA

Inspection Districts	By Falls of Roof, Draw Slate and Coal	By Cars	By Gas and Dust Explosions, Including Suffocation	By Electricity	By Miscellaneous Causes	Totals
First.....	3	3		1		6
Second.....	18	3			1	25
Third.....	8	1				10
Fourth.....	3	3		1	3	9
Fifth.....	5	1			1	7
Sixth.....	8	1			3	12
Seventh.....	13	2		3	1	19
Eighth.....	1		1			2
Ninth.....	10	5			1	16
Tenth.....	6	3			1	10
Eleventh.....	8		2			10
Twelfth.....	6	2		2		10
Thirteenth.....	7		1			8
Fourteenth.....	6	5	1	2	1	15
Fifteenth.....	6	2			1	9
Sixteenth.....	8	4		1	3	16
Seventeenth.....	2	2		1	1	6
Eighteenth.....			3			11
Nineteenth.....	13	3		3	3	22
Twentieth.....	13	10		1		24
Twenty-first.....	15	16		2	1	34
Twenty-second.....	12	1		1		15
Twenty-third.....	2	2				4
Twenty-fourth.....	10	6		4		22
Twenty-fifth.....	16	4		2		22
Twenty-sixth.....	14	2				16
Twenty-seventh.....	4	3			1	8
Twenty-eighth.....						
Totals.....	232	90	8	24	25	379
Percentages.....	61.21	23.75	2.11	6.33	6.60	100.00

CAUSES OF FATALITIES INSIDE MINES AND PERCENTAGE FOR EACH CAUSE, ANTHRACITE REGION OF PENNSYLVANIA

Inspection Districts	By Falls of Roof, Draw Slate and Coal	By Cars	By Explosions of Gas	By Electricity	By Explosions of Powder and Dynamite	By Blasting Explosions	By Falling into Shafts, Slopes, Etc.	From Miscellaneous Causes	Totals
First.....	20	7	1		1	4		1	34
Second.....	11	4			1	6			22
Third.....	6	1				6	15		28
Fourth.....	10	1			2	5			18
Fifth.....	9	2			1	2			14
Sixth.....	20	5	2	1		11	1	3	43
Seventh.....	21	8	9		1	7	2	3	51
Eighth.....	17	5				10	2	1	35
Ninth.....	15	4	6		1	4	1	3	34
Tenth.....	20	3	2		1	4	1	1	32
Eleventh.....	13	6					1	1	21
Twelfth.....	5	5	2		1	1	2	1	17
Thirteenth.....	3	2	2			3		1	17
Fourteenth.....	4	1	1			1		2	9
Fifteenth.....	8	5	6			2	3	1	25
Sixteenth.....	11	2	2		1	4	6	3	29
Seventeenth.....	6	6	12	1			1	5	31
Eighteenth.....	7	2	2		2	3	7	1	24
Nineteenth.....	9	2	2	1		2	4	3	23
Twentieth.....	4	2	3					1	10
Twenty-first.....	9	3				3		1	16
Totals.....	228	76	52	3	12	78	47	37	533
Percentages.....	42.78	14.26	9.76	0.56	2.25	14.63	8.82	6.94	100.00

\*Brief abstract of paper read before the Alabama Safety Association, Mar. 13, 1915.

†General superintendent, Republic Iron & Steel Co., Sayreton, Ala.

‡Though the fatalities in 1914 were lower than those in 1913, they were more numerous than in 1912 by 91. Moreover, in 1912 more coal was produced than in 1914. The tonnage per fatality in 1912 was 226,469, and in 1914 about 208,078.—EDITOR.



# The Labor Situation

**SYNOPSIS**—The Gallagher amendment fails to pass the Ohio Legislature, leaving the Green Anti-screen act in full force. The validity of the agreement not to strike was finally withdrawn from the court by the Elk Coal Co. A contract has been signed in British Columbia and Alberta.

The Ohio House of Representatives defeated the Gallagher amendment, which would have given the coal operators of Ohio the right to pay their men either on a run-of-mine or screen basis. The Ohio Senate had passed the measure by a good margin, and the House Committee on Mines and Mining had reported out the bill without any recommendation.

The vote stood 53 to 52, but as a two-thirds majority was needed, it would have been necessary under the provisions of the State Constitution for 9 votes to have been reversed if the amendment was to become law. Many members absented themselves rather than vote on the measure. Before a vote on the amendment itself was taken, the emergency clause practically making it effective at once was submitted to the ballot and defeated.

## It Is Said that Miners and Operators Are Playing Politics

The eastern Ohio operators are angry and openly declare that the legislators were playing politics. They allege that some of the members of the House do not want the question brought before the Governor for his approval or veto. It is claimed that the tax decentralization bill, a pet administration measure, is being held up in the Senate by those who favor the Gallagher amendment and will not be passed until the House passes the latter. There is little hope that the Gallagher bill will be reconsidered.

In other ways the strike situation in eastern Ohio is unchanged. The operators are still waiting for something to turn up, and since the Gallagher bill has failed of passage some believe that President Wilson and the federal officials will take action—what action is a matter of conjecture.

The miners have been notified that the free seeds of the federal Department of Agriculture have already been distributed to the extent of the congressmen's allotment. Consequently the miners cannot depend on that source for the planting of the small farms which they have secured. A collection is being made for funds, so that seeds may be purchased in the market.

## "General" Coxey Signs the Eastern Ohio Scale

"General" Jacob S. Coxey, the one-time famous leader of tramps who invaded Washington in the nineties, is now a coal operator or expects to be. He has signed the 47c. scale with the miners' organization, and has secured an option on the mine of the Meister Coal Co., at Flushing, Belmont County, Ohio, for 20 days, the purchase price being, it is said, \$100,000. He has agreed to take back all the men now on strike who formerly worked at the mine. The contract is signed in the name of the Massillon-Belmont Coal Co. It is said he will operate the mine on the cooperative plan. In 1913 this mine employed 105 men.

Meanwhile the Ohio mining department and philanthropists in Columbus have made an appeal for supplies, including food and clothing, for starving miners and their families in the Sunday Creek valley of the Hocking Valley district. Mines in that section have been closed and many of the miners are destitute.

## End of the Roseville Litigation

The strike at the mine of the Elk Coal Co. at Roseville, Ohio, was settled last week, and the 145 men involved have returned to work. As has been stated in these columns the coal company discharged three miners for breaches of discipline and all the men went on strike. The union officials tried to keep the men working and to have the trouble adjusted in the usual way, but they failed. Finally the charter of the Roseville local was forfeited by the state union officials. At the same time the Elk Coal Co. brought a suit for \$25,000 damages against the miners individually for failing to carry out their contract. The miners countered with a number of suits to collect wages due, amounting to approximately \$4000.

By the terms of the settlement the men go back to work, and the cases of the three discharged miners will be adjusted by arbitration under union rule. All of the suits have been dropped.

The men in two of the five mines of the Boomer Coal & Coke Co., Boomer, Fayette County, W. Va., a town on the north branch of the Kanawha River, went on strike Apr. 15 and returned to work on the following day. Two men were discharged as a result of a dispute regarding the yardage rate for the removal of slate. The two men were reinstated by the company, and an effort is being made to obtain an agreement which will remove possibilities of further misunderstandings. There are 1200 men working at the Boomer mines, but barely 500 of these were affected by the strike.

Three hundred men of the Hutchinson Coal Co. at Mason, Mason County, W. Va., a town on the south side of the Pomeroy Bend on the Ohio River, went on strike on Apr. 12. There is a strike also at Mucklow on Paint Creek, resulting in some way from the abandonment of room-driving and the concentration on heading work. It does not involve the Paint Creek Collieries Co.

## The Vesta Trouble at an End

The Vesta Coal Co. at its operation at California, Washington County, Penn., on the west bank of the Monongahela River, has agreed to reinstate John Dale as checkweighman, to withdraw the charges against the men and women arrested and the eviction notices against seven men in the company employ. As a result the company will resume work at No. 5 mine. About 800 men were affected by the dispute and consequent strike.

## Recent Oklahoma Wage Settlements

On Apr. 10 Peter Hanraty, of McAlester, Okla., the new president of the district union, made an agreement with the Blue Ridge Coal Co., of Chant-McCurtain, Okla., relative to the wage scale. A union-wage contract was also signed with the Samples Coal & Mining Co., near McAlester. This mine is small and produces about 200 tons per day; it has been worked by the Osage Coal & Mining Co., receivers. Hanraty has also made an agreement with the Kali-Inla Coal Co., one of the Bache-Denman subsidiaries operating near Gowen, Latimer County, Okla., on the Chicago, Rock Island & Gulf Ry. This company was involved only as a creditor of the ten Bache-Denman companies which went into receivers' hands as a result of strike violence.

## New Agreement in British Columbia and Alberta

A new agreement has been made between the Western Coal Operators' Association and the representatives of the coal miners of Alberta and the Crownsnest district of British Columbia, which together comprise District No. 18 of the United Mine Workers of America. The miners voted on the acceptance of the terms of this contract on Mar. 28, upward of 4000 men casting their ballots. Seven of the locals—Corbin, in British Columbia, and Bellevue, Blairmore, Canmore, Georgetown, Klipp and Nordegg, all in Alberta—voted against acceptance of the new agreement, while 11 favored its ratification. While official figures are not available, it is reported that the majority in favor of the new agreement was about 1200 votes.

The minority showed much strength, for which the increased cost of living and several new clauses in the agreement were no doubt responsible. It is also safe to add that had industrial conditions been more propitious few indeed would have cast their vote in favor of any proposition that did not give an advance commensurate with the abnormally high prices of commodities. The mines throughout District No. 18, which supplies coal to northeastern Washington and northern Idaho and Montana, however, are not being worked on full time, so with the coal supply much in excess of the demand there was nothing for the miners to do but accept the best terms which their representatives had been able to secure.

## A Short-Time Contract with Fines for Violations

The term of the new agreement is for only two years, while that which expired on Mar. 31 had been made for three. The operators contended for a four-year term, but eventually gave way. The number of persons on the committee for the settlement of disputes was changed, allowing three representatives each for miners and operators instead of one as formerly provided. The procedure for settlement remains as before. To prevent local strikes by the employees and lockouts by the operators, a fine of \$1 a day is levied on each man who refuses to work; a similar fine is placed on the operator of \$1 a day for every man involved in a lockout. All decisions and rulings in connection with the settlement of disputes under the old agreement stand under the new. It is provided that no rulings of the United Mine Workers of America, either now in force or hereafter passed, shall have any effect on the new contract.

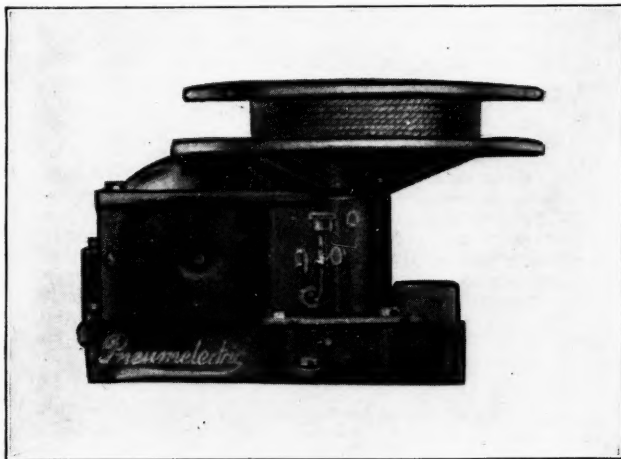


## New Apparatus and Equipment

*Believing that one of the greatest services that a journal such as COAL AGE can render its readers is to acquaint them with new and improved equipment which may be employed directly or indirectly to the benefit of the coal-producing industry, this department is inaugurated. For the present it will appear in the second and fourth issues of each month. We shall therefore be glad to receive from builders, manufacturers or dealers brief descriptions of new or improved pieces of apparatus in which they are interested, the use of which will tend toward better results in or the economic development of the fuel industry or any of its numerous ramifications.*

### Gathering Attachment for Mine Locomotives

It is frequently desirable to use the larger locomotives about the mine for work other than that for which they have been primarily installed. It is often convenient to be able to use these machines for handling a few cars or for even handling one car from points which cannot be



THE GATHERING ATTACHMENT

reached by means of the trolley wire, such as in the extension of headings, in rooms, around the tippie and under other similar conditions. There are also many occasions when these locomotives are not being operated to their maximum capacity and when they could be used in place of the smaller gathering locomotive with a considerable reduction in the cost of operating the mines on short tonnage.

An inexpensive, compact and powerful little device has been introduced for this purpose and is being manufactured by the Pneumelectric Machine Co., Syracuse, N. Y. It is called the Pneumelectric gathering-attachment for mine locomotives. It is at present being used successfully and lends itself admirably to the purpose for which it was designed.

A motor built especially for mine service, a low flat spool or drum, motor-pinion, drive-gear and band-brake

are the elements making up this attachment, and owing to the few parts involved it will be noted that it is most simple. The motor and gearing are completely inclosed, and fully protected from dust or damage of any kind, while the motor is of sufficient capacity for an 800-lb. rope pull, which is amply sufficient for the work which has to be done by a device of this nature.

The base is so designed that it can easily be attached to the end frame of the locomotive, and as the extreme dimensions are but 18 in. height, 18½ in. width and diameter of drum or spool over the flange 23 in., it can be placed on any of the standard locomotives without in any way interfering with the operation of the machine in the usual way or occupying space required for any other purpose.

### A New Bicycle Type of Hoisting Sheave

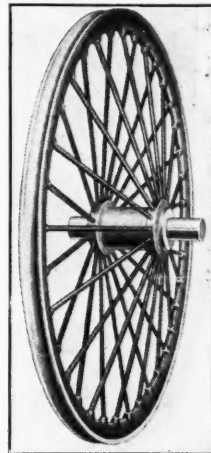
The Medart Patent Pulley Co., of St. Louis, Mo., has recently placed upon the market what is called the Medart bicycle type of hoisting sheave.

This is not particularly dissimilar in appearance from many bicycle-type sheaves that are at present in use. It is, however, so constructed that expansional stresses in the rim and hubs are entirely avoided.

The spokes may be made of either wrought iron or mild steel, and the rim and hubs are ordinarily composed of cast iron. For extremely heavy duty, however, these parts may be made of semi-steel, which for this class of service is more durable and satisfactory.

These wheels may be furnished in any size up to 15 ft. in diameter, the size of course depending upon the nature of the work to be

done and the diameter of the rope or cable which passes over the sheave.



ONE OF THE NEW SHEAVES

### A New Wagon Loader

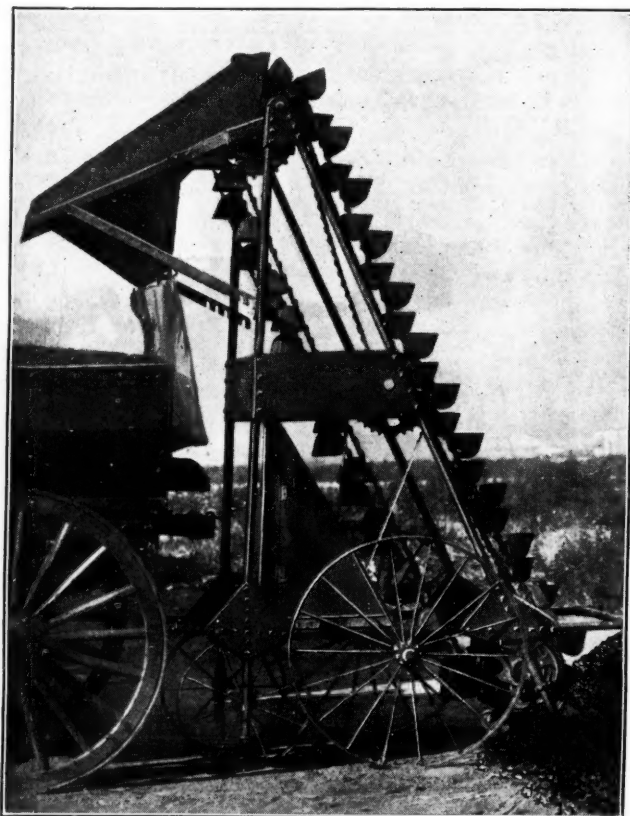
A new device for loading coal, sand, gravel or other granular material upon wagons from stock-piles or cars has been placed upon the market by the Hudson Machinery Co., Park Row Building, New York City.

This device consists of a triangular framework of pipe mounted upon suitable wheels and carrying a double conveyor chain driven by either a gasoline engine or an electric motor. An adjustable chute, which may be equipped with a screen, is also provided.

This machine weighs 1400 lb. and may be easily handled by two men, while one man may readily move it upon a suitable platform or other comparatively smooth and un-

yielding surface. When equipped with a 2-hp. motor or engine it will handle from 50 to 60 tons of coal per hour.

The particular advantage of the double chain provided with small buckets is that a more uniform torque is brought upon the engine or motor. This also eliminates the severe strains produced by large buckets. The elevator and chain shafts are all provided with ball bearings, which at once reduce the friction of these parts and render frequent oiling or greasing unnecessary.



THE NEW LOADER FILLING A WAGON FROM A STOCK-PILE

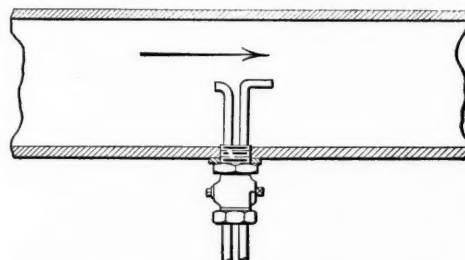
Since the material is delivered from the elevator chain to the chute in a practically continuous and unbroken stream, the efficiency in screening is maximum. A suitable hopper for the screenings is provided, and when it is not desirable to screen the material being handled a plate may be substituted for the perforated screen.

### A New Steam Flow Meter

A new steam flow meter which has met with success in England is being placed upon the American market by James G. Biddle, of Philadelphia, Penn. This instrument is known as the Curnon steam meter and is especially applicable to the medium size or small industrial power plant for measuring the amount of steam generated or consumed by any one unit.

This instrument, which draws a continuous curve upon a 24 hr. chart, utilizes the basic principle of the Pitot tube in its measurement of steam flow. The connections in the steam pipe (see sketch) consist of a leading and trailing tube opening; the first squarely facing the flow while the other faces away from it. The difference in pressure registered by means of these two tubes will therefore be in maximum.

This difference in pressure is communicated to the drawing pen through a series of levers so arranged that the height of the line above a given datum is at all times



THE LEADING AND TRAILING PITOT TUBE NOZZLES IN THE STEAM PIPE

a measure of the number of pounds of steam flowing per hour in the steam pipe. The total amount of steam generated or consumed during any period of time may be calculated by integration of this curve.

### Recent Legal Decisions

**Inspection of Mine Machinery**—A coal operator cannot delegate to an employee the duty of inspecting a coal-cutting machine or other mining machinery, so as to avoid liability for injury to another employee, but the operator may impose the duty of inspection upon employees who are required to use such machinery, so far as they are competent to make an intelligent inspection, and thereby avoid responsibility for injury to an employee caused by his own failure to make proper inspection of an appliance used by him. (Virginia Supreme Court of Appeals, *Hairston vs. Pocahontas Consolidated Collieries Co.*, 83 Southwestern Reporter 1041.)

**Abandonment of Coal Leases**—A coal lease covering several tracts of land, and providing different time limits for removal of the coal from them, will be deemed to be abandoned by the lessee where nothing has been done by him under the lease until expiration of the time limits on more than half of the tracts, and after the remaining tracts have been leased to a third person. "Mere nonuse of a right acquired by contract does not, in itself, constitute an abandonment of that right, but nonuse coupled with other circumstances and conditions which expressly show an intention to abandon, when acted upon by the other party interested, has the effect of destroying the rights acquired." (Iowa Supreme Court, *Ray Coal Mining Co. vs. Ross*, 151 Northwestern Reporter 63.)

**Operation of Mines by Independent Contractors**—When an owner of coal property contracts with another for its development, he is under no obligation to the latter's employees to provide safety appliances. It is even held that where a mine, with certain existing tracks, etc., was worked under such a contract, the owner was under no duty to provide a derail at the mouth of the mine to avoid injury to miners through cars running away down the track. The miners must be deemed to have assumed the risk of negligence of their coemployees in permitting the cars to escape control, if they knew that a block was the only means of stopping the cars. (Alabama Supreme Court, *Connors-Weyman Steel Co. vs. Kilgore*, 66 Southern Reporter 609.)

**Authority of Representatives**—In a suit involving a coal company's liability for a contract made by a representative for purchase of certain mining rights on credit, it is held that where agency is disputed by the person sought to be held as principal it cannot be proved merely by showing declarations of the supposed agent as to his authority. A principal is responsible for contracts of an agent made within the scope of his apparent authority, although they may not have been expressly authorized. An agent has power to pledge his principal's credit only when there is express authority to that effect or the power is inferable from the fact that no funds have been provided to enable a purchase for cash. By retaining the benefits of a contract made by an agent, his principal ratifies the transaction, regardless of whether it was expressly authorized. (Kentucky Court of Appeals, *White Plains Coal Co. vs. Teague*, 173 Southwestern Reporter 360.)

## Editorials

### Royalton, Ill., Rescue Work

Some time ago we published an account in small type of the Royalton, Ill., explosion. Our action in thus soft-pedaling the achievement of the Illinois rescue corps was as "small" as the type in which it was printed. Since Layland, we have learned better. For at Royalton, the mine was explored in less than 24 hr. and in foul air.

No one was saved; no fires were extinguished, because no living persons remained in the mine and the coal had not become ignited. But what was done was done right, and had the opportunity presented, men would have been saved and the mine truly salvaged. As it was, it remains a feat which lacked only occasion to make the public herald it as glorious.

It is fortunate that Illinois has such rescue corps, for it greatly needs them. The coal is quite susceptible to fires. Wherever black powder is used it is customary to employ runners to put out the many conflagrations which are started by the shot-firers, and this precaution is often taken even in many mines where permissibles are employed.

In fact in all mines, except perhaps those of Pennsylvania, the risk of coal fires following an explosion and causing another disaster must always be considered, and exploration should largely be done in foul air. The first duty is to look for fire and for live men; a secondary consideration indeed is the removal of bodies and the restoration of the air current.

It is true that the Pennsylvania and perhaps even the West Virginia mine inspectors may be justified in their defense of fresh-air work. In those states it is possible that the advantage of oxygen apparatus is alone in the speed of exploration possible with its help. The main work in those states is to find entombed men. The possibility of fire and a second disaster unless caused by an open light is remote in Pennsylvania. In fact we do not recall a case, though instances of a second explosion are not unknown even in the anthracite region. These secondary disasters have, however, been due to ignition of firedamp by open lights as at the Brookside mine.

To our mind the Layland rescue work is a forcible exhibit of the value of oxygen apparatus, because it shows how slow fresh-air methods must be even with the best of management. No one doubts that the recovery work was valorously and skillfully performed as a piece of fresh-air work; but, like all recovery dependent on ventilation, it perforce must move slowly.

Rescue work with oxygen apparatus is like *aéroplane* work in war, while fresh-air methods resemble the advance of infantry. In the latter case the roads must be cleared to carry forward props and brattice cloth, the airways must be opened wide to supply air, and the progress of recovery must always be slow. The force engaged must also be proportionately large.

Viewed as fresh-air recovery, the Layland rescue work

was a complete success by every account so far published, and also by records hitherto established, but oxygen-apparatus work would have been absolutely safe against the fire risk and more rapid in its performance. To this latter statement exception has been taken, because it has been said that work in advance of the air would have discovered the miners early only to expose them to the foul air and to end in their death.

It is true that had the entombed miners at Layland been discovered earlier by the oxygen-apparatus men they could not have been rescued at that time, and perhaps the rescuers might have been imprudently desirous of breaking into their prison house before the air was made fit and were prevented from so doing by the delay in discovering the men. We should not be asked to assume, however, that such a folly was possible on the part of the rescuers. Had they known where the live men were, safe methods of rescue might well have been put into operation and all the men removed in a short while.

### Muzzling the Ox Which Treads Out the Corn

Nemesis follows the unjust, but the unjust do not know it. Such an injustice was well exemplified in a conversation recently overheard. The fate which follows the injustice is perhaps not so obvious, but none the less inevitable.

A coal-man was discussing the ammunition question—just now such an acute subject for discussion—with two representatives of manufacturing concerns. The coal-man questioned whether the charter of a certain corporation manufacturing motors and containing "motor" in its title would permit it to make shrapnel.

In support of the probability of his surmise he instanced a case in his own experience where he had been hampered by unreasonable charter restrictions. He had a plot of ground in Pennsylvania underlaid with both coal and iron and wanted to charter a company to mine both, but found that Samuel W. Pennypacker, then governor, was strongly opposed to granting a charter giving a single company a right to mine all the minerals on one piece of land.

While the coal-man recovered his breath, his two manufacturing friends broke the silence together. It was clear to them, they argued, that a great difference existed between the mining of an essential product like coal and the manufacturing of any article whatsoever. The interest of the public was paramount. The integrity of your coal corporation might possibly be so sullied, if it had too liberal a charter, that the public interest would suffer. "Coal is coal," was the unanswerable argument—unanswerable because it made no pretensions of logic.

When the parties passed out of sight we heard the coal-man in vain protesting that the man who produced an essential of life was performing a service to the community, and in proportion to the importance of his service



to mankind should be the solicitude of the public for his welfare. Because he was a benefactor was no reason why he should be plucked and made to pursue his business of mining coal and iron under exceptional restrictions while the man who specialized in billiard tables, golf-balls, ornamental ironwork or motor cars was free. The public did wrong to argue of the latter that "his are minor services; he is a negligible factor in the world anyway; therefore let him get rich as he will; it is no concern of ours." This argument makes a privileged character of the saloon-keeper and the manager of a faro table.

The coal-man was not a logician, but it may be well to add here to what he had to say. The public thinks that, in its private interests, in its desire for cheap fuel, it can override the coal producer. That it may have money for its beer and skittles, it can rob by unfair legislation and dishonest discrimination the man who supplies what we all must have. But justice forbids and the dishonest public must suffer for its folly.

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*Letter No. 1*—Referring to the liquor question, to which attention has frequently been drawn in these columns, permit me to mention one phase or condition that has not received the attention it merits; that is, the financial burden the drink habit imposes on a community.

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A short time ago an incident occurred that is not uncommon in all mining communities. At a meeting of the men of the place, one of the speakers told briefly of the needs of a certain family residing among them, stating that the mother was left with the support of three small

children and, being unable to pay the rent, had asked permission to store her household goods in a neighbor's tool-house. The husband and father of this family, who was a hard drinker, had met with an accident that had crippled him for the time.

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The difference between the man who spends his earnings for drink and the man who saves is more pronounced during the periods of enforced idleness so frequent about the mines. At such times the drinking man finds himself without money or credit and becomes the necessary burden of his more thrifty neighbors. If the suspension of work is prolonged, the industrious and sober class often find themselves short of funds; but their credit is generally good in the expectation of an early resumption of work.

At the close of such a period, it happens too often that the sober element face a heavy debt, a large portion of which would rightly be shared by the improvident class who have been nourished and supported by the others, but who now start work free of any recognized debt. To such an extent is this condition of affairs true in mining towns where saloons are permitted that most hard-working miners are beginning to realize that liquor in a mining town is an unqualified evil. But for the burden laid on them as a result, many would be willing to let every man follow his own course of living, pleading as an excuse, "Am I my brother's keeper?" Good judgment and sound common sense, however, lead these men to protest against the drink habit.

These observations are the result of my own experience in this neighborhood, which is a mining community, and I am proud to say allows no one to suffer regardless of whether he is worthy or unworthy of help—necessity is the deciding factor. There is no doubt that this experience can be duplicated in other fields of labor, since no community or industry has a monopoly of either vices or virtues. Let every man who has observed the evil of the drink habit do what he can to suppress it in his own community.

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*Letter No. 2*—Having been directly concerned in coal mining, in one capacity or another, for the past 32 years, and for several years having served as mine foreman, I feel the great need of an active campaign against the liquor traffic in mining towns and camps.

I have observed with deep concern the degrading effects of drinking on miners enslaved by the habit. In many cases, the drinking is carried to excess, and Saturday night and Sunday are spent regularly in drinking and carousing. As a result the miner goes to work Monday morning totally unfit for his duties in the mine. Tuesday he is little better; but the last days of the week he bestirs himself and works like a demon in preparation for another carousal at the week-end, which is his regular habit.

The effects of a miner's drinking are not confined to himself alone. He is a source of danger in the mine, not knowing how to protect himself or to safeguard his fellows. My experience and observation have taught me that liquor is the direct cause of hundreds of mine accidents.

Although it is true that the saloon is excluded from some mining camps, in many cases this condition is offset by the work of the "boot-legger." He is a man who is licensed by the Federal Government, through its Internal Revenue Bureau, to sell liquor in any part of the country without molestation by the revenue collectors.

I have made a little investigation on my own account along this line and find that the Federal Government practically holds that on the payment of a small revenue tax the party making the payment is free to engage in the sale of liquor anywhere within the United States, so far as the Federal Government is concerned.

Having this license, the "boot-legger" generally finds it an easy matter to evade the state or county officers. But if, perchance, he is brought into court his sentence is light, and he escapes without a fine by serving from 15 to 30 days in jail. The Federal Government practically says to these men, "You must run your own chance with the state or county authorities, but you will not be molested by this government after paying the license fee required."

As I understand it, the National Administration, through Secretary of State Bryan and Democratic Leader Underwood, refused to indorse the proposed constitutional amendment that would do away with the liquor traffic throughout the country. The reason given for this refusal was that prohibition was a matter to be handled locally by the several states and counties. Nevertheless, without a protest from these "states'-rights" advocates, the Federal Government continues to license liquor selling, even where that selling would be a violation of a state or county law.

Permit me to ask, Is such action consistent in itself? It is well known that "boot-leggers" fear Uncle Sam, who brooks no trifling with his revenue regulations. They do not hesitate, however, to take chances with state and county authorities. To this extent, is not the Federal Government lending its aid to violators of state law? In some cases the court has ruled that internal revenue collectors could not be compelled to testify concerning the business of "boot-leggers" who had paid the internal revenue tax.

I want to ask, Is it not possible to enact a law that will wipe out this scandal? The cry of "Safety first" comes from the North, South, East and West, while its direct cause is licensed by the supreme government. It is my belief that three-fifths of all accidents and crime are the results of the manufacture and sale of liquor, which affects alike all industries of the country. Let us

hear from many on this question that so vitally concerns the success and safety of all.

A MINE FOREMAN.

Rooke, Tenn.

### Longwall in the Pittsburgh Seam

*Letter No. 6*—I want to say a few words in reply to Engineer's Letter No. 2, COAL AGE, Mar. 6, p. 431, regarding the working of No. 8 seam in eastern Ohio on the longwall plan. Although the writer of the letter states that he has had "a varied experience in eastern Ohio and the Panhandle mines," etc., I should judge he had not profited by such experience. I can see no ground for his argument condemning the use of longwall in the No. 8 seam, since this method of mining has not been given a fair trial in the eastern Ohio field.

I am well acquainted with the nature of the overlying strata in that section of the coal field and understand fully the bearing that it has on the success of longwall working. My knowledge of these conditions gives me reason to believe that the No. 8 seam in eastern Ohio can be worked successfully on the longwall plan. I freely admit that the limestone, as stated by Engineer, "gradually sags or bends under the enormous weight until it comes to rest on the mine floor." While this effect produced in the strata demonstrates an enormous roof pressure, it does not prove that this pressure is necessarily exerted on the face of the coal.

When longwall work is properly conducted, it is well adapted to avoid the harmful effects of great roof pressure. This result, however, cannot be accomplished by "leaving sufficient pillars," as Engineer seems to suggest or by leaving blocks of coal. Such measures would throw the pressure on the face of the coal and on the entries and roads instead of allowing it to settle firmly on the floor, where it belongs. I want to suggest that where *all* pillars and blocks of coal are removed and sufficient packwalls are well built there need be no fear of the occurrence of an extensive squeeze or any excessive pressure being thrown on the face of the coal or on the entries.

Since reading the letter of Engineer, I have talked with many men in this district who have had from 30 to 60 years' experience in all systems of working coal, and these men have expressed the same opinion; namely, that the longwall system can be successfully applied to the working of the No. 8 seam in eastern Ohio if men are employed who understand that system of working practically and are able to put the system in operation either when opening a new mine or when starting longwall from room-and-pillar workings.

I am informed that the mines on the Norfolk & Western Ry. are working the longwall system, also that a Pennsylvania company has adopted that system at one of their mines. I have also had letters from several coal companies in West Virginia stating that they are going to adopt the longwall system in mines they are operating.

In closing, I want to draw attention to Engineer's statement that "invariably when a superintendent and mine foreman from Pennsylvania take charge of a mine, either in this district or the West Virginia Panhandle, they want to start to draw the pillars as they do in the same seam in the Pittsburgh district." I will say that the roof pressure would not stop these superintendents and fore-



men from drawing the pillars if a proper system of mining was adopted in those mines. It would then be far better that the pillars be taken out in order to allow the roof to settle firmly on the bottom.

I will say further that there is not a mine in this district that is getting out 85 per cent. of the coal, while in my opinion it is possible by the adoption of the longwall system to extract from 95 to 98 per cent. of all the coal in the seam. I might venture to assert that in some of these mines the coal extracted does not exceed from 45 to 60 per cent. of that in the seam at the present time and with the present system of mining.

G. R. WADDELL.

Moundsville, W. Va.

### Experiences in Rescue Work

The recent references to the Layland mine explosion that occurred Mar. 2, in the mine of the New River & Pocahontas Consolidated Coal Co., as described in *COAL AGE*, Mar. 20, p. 508, recalls my own experiences in rescue work in mines of the Pocahontas region. I am led to refer briefly to these experiences in view of the remarks made by Chief Inspector of Mines R. A. S. Redmayne, in his report of the Cadeby Main Colliery explosion, which occurred in South Yorkshire, England, July 9, 1912.

As stated in *COAL AGE*, Vol. 3, p. 953, Mr. Redmayne in this report condemns the lack of organization at mines, by reason of which men are permitted to enter the mine unauthorized, following an explosion. He is said to have advanced the opinion that "the management of a colliery is not justified in allowing persons to risk their lives in the recovery of dead bodies. There is always great risk of a second explosion when a fire is known to exist underground. It sometimes requires much moral courage to restrain oneself and to prohibit others from undertaking a risk of this nature."

No doubt these remarks were suggested by practical facts in Mr. Redmayne's own experience; but it is a hard proposition to deny volunteers the privilege of entering a mine immediately after an explosion for the purpose of rendering any possible aid to fathers or brothers who may be entombed in the mine workings.

In the past few years the question of rescue work in mines has received much careful attention. Many forms of rescue appliances and devices have been developed, and much useful information and instruction have been given throughout the coal-mining states by the federal Bureau of Mines, by means of instruction cars that travel from place to place in the various mining districts.

Much credit is due to the Bureau of Mines for the great work it has already accomplished along this line, and it is the earnest desire of all well-minded mining-men that this effective work shall continue. It is much to be regretted, however, that there are yet some operations that have not provided such rescue appliances, while they know that they may need these at any moment for the preservation of life and the security of property.

The mining laws of many of the coal-producing states require that the mine equipment shall include such apparatus as will enable the rescue of men from mine workings and the resuscitation of men overcome with gas, besides a proper supply of approved safety lamps,

first-aid outfits, blankets, stretchers and ambulances, for the care of the injured. For example, the following sections relating to resuscitating apparatus and rescue crews are taken from the revised (1913) coal-mining laws of Colorado:

Sec. 89. Every mine employing as many as 25 men underground shall be equipped with apparatus as follows: One resuscitating apparatus, a suitable supply of auxiliary apparatus, and "first-aid-to-the-injured" outfit, including stretchers with a woolen and waterproof blanket for each stretcher and a suitable supply of olive or linseed oil.

Sec. 90. The owner of every mine employing as many as 100 men underground shall endeavor to have trained for rescue work as many as three crews of four men each, and the owner of every mine employing fewer than 100 men underground shall endeavor to have two such trained crews.

My own experiences in rescue work began Feb. 8, 1906, when a local explosion occurred in the Parral shaft, at Parral, W. Va., where I was engaged on a contract of rockwork for the White Oak Fuel Co. The explosion occurred in the evening, just before the night-shift descended the shaft. The water-bailers, as was their custom, had preceded them to bail the water from the working-places, in preparation for the work of the nightmen.

On hearing the report of the explosion, I ran to the shaft and found the cage hung up in the headgear. This was soon released, however, and the mine superintendent and myself descended the shaft slowly by a prearranged set of signals. Owing to the debris blown into the shaft, the cage could not touch bottom, but we succeeded in getting down to the entry and rescued one of the water-bailers who had been thrown down with his mule close to the shaft bottom. This man was taken to the surface and recovered from his injuries completely in a few months—the result of quick rescue work.

Another explosion occurred in the St. Paul district of the Pocahontas mine, at Pocahontas, W. Va., Oct. 3, of the same year, when 35 men lost their lives. A previous explosion that occurred in the same mine, Mar. 13, 1884, killed 112 men, including the general superintendent of the company, who was overcome by the afterdamp on entering the mine for the purpose of rescue.

At the time of the second explosion (1906) I was employed at an adjoining mine, and in answer to a call for volunteers, in company with others, I assisted in the rescue work, which was under the efficient direction of William Lockie, the general superintendent, and T. D. Dennon, a company inspector. Being practical mining-men, these officials quickly organized a rescue party, which was divided into three gangs. A few of the more experienced men were selected to explore the workings ahead of those who were engaged in building brattices and repairing stoppings, while others handled the material and carried out the bodies of the victims as they were found. The necessary tools, safety lamps and materials were soon collected and the rescuers entered the drift mouth, which was protected against intruders by ropes stretched across the entrance and a guard.

Although there were no helmets or other breathing apparatus available at that time and place, the work was pushed rapidly forward and many bodies recovered and the circulation of air restored in the mine. This work was carried as far as the top of the dip workings, when it was thought advisable to proceed no further, owing to the accumulation of afterdamp in that section of the mine. It was decided that a strong current of air would be required to remove the gas from that section



so as to make safe the work of exploring. Much credit is due to the practical judgment of those in charge of the rescue work at that time.

The Lick Branch mine, near Switchback, W. Va., which was operated by the same company as the Pocahontas west mine, was visited by two explosions, resulting in heavy loss of life. The first of these occurred Dec. 29, 1908, and was followed a few days later, Jan. 12, 1909, by a second explosion. In the first instance 50 lives were lost, while the second resulted in the death of 67 more persons.

As before, I was one of those who volunteered in the rescue work and was at first employed to inspect the safety lamps before these went into the mine and later to assist in restoring the ventilation in the mine by building brattices as required. The work was well organized under District Mine Inspector William Phillips. The men worked in relays from 8 to 10 hr. each. Chief Mine Inspector J. W. Paul arrived a little later and greatly assisted the work of rescue by his practical knowledge and wide experience, with the result that many bodies were recovered and ventilation rapidly restored throughout the mine.

The second explosion occurred early in the morning, shortly after the miners had gone to work. The only man rescued in this case was Mine Foreman Bowers, who

had just entered the mine and had proceeded but a few hundred feet from the drift-mouth when the explosion happened. He was blown some distance by the force of the explosion. His ribs were broken, and the man who was with him was killed. The bodies, in this case, were all recovered within three days. I assisted in the rescue work in both of these explosions, and was overcome with gas in the forenoon of the last day of the second explosion. At that time we were trying to enter some workings where it was supposed bodies would be found.

In the opinion of many practical mining-men, the decrease in the number of mine explosions in recent years is due to the increase of the knowledge of mining conditions and the causes of such explosions. Some believe that the increased use of permissible explosives has assisted in reducing the danger of explosion. However, there are many other factors of greater importance in this respect than the kind of explosives used. Among these may be mentioned the undue accumulation of dust and gas, changes in barometric pressure, sudden outbursts of gas in the mine workings, the use of mixed lights in gaseous mines, and the need of more efficient ventilation, including humidification of the mine air.

J. E. AMBROSE.

—, N. M.

## Study Course in Coal Mining

By J. T. BEARD

### The Coal Age Pocket Book

**Calculation of the Theoretical Flame Temperature**—The theoretical temperature of the flame of a burning gas is the highest possible temperature that results from its complete combustion, assuming (what is never the case in an open-burning flame) that only sufficient air is present for the complete combustion of the gas.

There is always an **excess of air** in the outer envelope or zone of a flame exposed to the air, and this excess of air beyond what is required for the combustion absorbs heat and lowers the temperature of the flame in the **outer zone**.

The temperature within or in the body of the flame more nearly approaches the **theoretical maximum**, which can be calculated. This maximum temperature is found by dividing the total **heat of combustion** above 32 deg. F., per pound of combustible, less the heat rendered latent in the water vapor produced, by the heat required to raise the temperature of the **products of combustion** one degree. The quotient obtained gives the rise of temperature above 32 deg. F., which must therefore be added to it in order to find the theoretical temperature of the flame.

**Flame Temperature of Methane Burning in Air**—The first portion of the process is similar to that explained in the calculation of the lower inflammable limit of methane and need not be repeated here. It was found that for every pound of methane burned there was produced **carbon dioxide**, 2½ lb.; **water vapor**, 2¼ lb.; and **nitrogen**, 13.39 lb. So far the two operations are the same.

As before, one pound of methane, burning to carbon dioxide and water at 32 deg. F., develops 23,513 B.t.u. From this must be subtracted the heat required to convert 2¼ lb. of water at 32 deg. into steam at 212 deg., which is absorbed in the **formation of the water vapor**; thus,

$$23,513 - 2\frac{1}{4} (212 - 32 + 966) = 20,934.5 \text{ B.t.u.}$$

The result obtained is the **net heat available** for raising the temperature of the products of combustion, which constitute the larger portion of the body of the flame.

It is necessary now to calculate the heat required to **raise the temperature** of the respective weights of the products of combustion **one degree**. The weight of each of these products, as previously given, is multiplied by its specific heat for constant pressure and the sum of these products is the total heat required for each degree of rise in temperature.

	Sp. Heat	Weight	B.t.u.
Carbon dioxide,	0.2163	× 2.5	= 0.5408
Water vapor,	0.4805	× 2.25	= 1.0811
Nitrogen,	0.2438	× 13.39	= 3.2645

Heat absorbed, per degree rise..... 4.9404

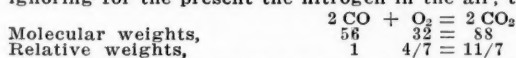
Finally, the **rise of temperature** in the body of the flame that is possible, in this case, assuming that all of the heat developed is absorbed by the products of the combustion only, is as follows:

$$\text{Rise of temperature, } 20,934.5 \div 4.9404 = 4238 \text{ deg. F.}$$

This rise of temperature, like the heat developed by the combustion, is estimated from 32 deg. F. The theoretical flame temperature is therefore  $4238 + 32 = 4270$  deg. F.

### The Coal Age Pocket Book

**Flame Temperature of Carbon Monoxide**—The first step is to write the chemical equation expressing the reaction that takes place when carbon monoxide burns to carbon dioxide, ignoring for the present the nitrogen in the air; thus,



Since oxygen forms 23 per cent. of normal air, by weight, and nitrogen 77 per cent., the ratio of nitrogen to oxygen is 77 : 23, and the relative weight of nitrogen involved is

$$\frac{4}{7} \times \frac{77}{23} = \frac{44}{23} = 1.91 + \text{ lb.}$$

Hence, for every pound of carbon monoxide burned, there is produced carbon dioxide, 11/7 lb.; and nitrogen, 1.91 lb.

The heat of combustion of carbon monoxide burning to carbon dioxide, as taken from a table giving the heat of combustion of various substances, is 4325 B.t.u. per lb. of gas burned. There being no water vapor formed in this reaction, the above is the actual heat available for raising the temperature of the products of the combustion, which form the body of the flame, disregarding radiation and conduction losses.

Now, calculating, as before, the heat required to raise the temperature of the respective weights of the products of this combustion **one degree**, by multiplying the weight of each product by its specific heat for constant pressure and finding the sum of those products, we have

	Sp. Heat	Weight	B.t.u.
Carbon dioxide,	0.2163	× 11/7	= 0.3399
Nitrogen,	0.2438	× 1.91	= 0.4657

Heat absorbed, per degree rise..... 0.8056

The resulting **rise of temperature** above 32 deg. F., in the body of the flame, which determines the theoretical flame temperature, is then  $4325 \div 0.8056 = 5369$  deg. F., and the corresponding temperature,  $5369 + 32 = \text{say } 5400$  deg. F.

Although the **presence of moisture** (water vapor, H<sub>2</sub>O) is necessary to the ignition of carbon monoxide, it is not required to take this into account in making the above calculation, for the reason that the **heat of dissociation** is balanced by the **heat of recombination** in the molecule of water and no loss of heat is assumed to occur. It has been suggested that the water only serves to start the reaction by effecting the ionization of the elements.

The theoretical flame temperature as calculated above, however, both for methane and carbon monoxide, is considerably modified by the **humidity of the air** supporting the combustion.

**Volume of Flame**—It is frequently estimated roughly that the volume of a flaming gas is proportional to its absolute temperature. For example, assuming the original temperature of the gas as 0 deg. F., the theoretical flame volumes of methane and carbon monoxide are,

$$\begin{array}{l} \text{Methane, } 460 + 4270 \div 460 = \text{say, } 10 \text{ volumes.} \\ \text{Carbon monoxide, } 460 + 5400 \div 460 = \text{say, } 12\frac{1}{2} \text{ volumes.} \end{array}$$

## Inquiries of General Interest

### Gas Due to a Mine Squeeze

In our mine, recently, a squeeze occurred on the cross-entries, shutting off the air supply from those entries, which rapidly filled with gas as a result. The gas could be found within 6 ft. of the main-return airway, but did not seem to have any tendency to mix with the return current.

The peculiarity of this gas to which I especially want to draw attention was the effect it produced on the flame of a safety lamp. The lamp would burn all right, on the edges of the gas, close to the floor, but on being raised toward the roof the flame would be gradually dimmed and finally extinguished. I would like to ask if this gas is nitrogen and what are its properties? Is such gas often found in quantity, as we have experienced in this case?

FIREBOSS.

—, Penn.

In order to properly judge of the nature of the gaseous mixture in this case, it is necessary to consider the conditions existing at the point where the action of the gas was observed; namely, at the mouth of the return airway where the cross-entries join the main return.

Under the conditions described in this inquiry, it is reasonable to suppose that the temperature of the air confined in the cross-entries has risen and is higher than that of the air current passing on the main-return airway. This difference of temperature would cause a slight circulation at the mouth of the cross-entry, whereby the cooler air of the main current would set in at the bottom of the cross-entries, while the warmer air laden with the gas would issue slowly from these entries at the roof. This circulation is of course local, occurring only at this point and proceeding so gradually as to be imperceptible. The effect, however, is to carry the gas accumulated in the cross-entry upward toward the roof, where it naturally circulates owing to its higher temperature.

This gas observed at the roof is probably a mixture consisting mainly of the depleted air of the cross-entries (which is low in oxygen and high in nitrogen content) and containing also carbon dioxide and, possibly, more or less methane.

In this connection, it is well to note that the stagnant air of the cross-entries soon becomes more or less depleted of its oxygen, which is absorbed in large quantities by the freshly exposed surfaces of the coal at the working face. Also, the action of the squeeze has probably driven out considerable carbon dioxide from the rooms and abandoned and void places in these entries and the adjoining workings.

Therefore, in the absence of any analysis of this gas and further information that would determine its character, it is reasonable to suppose that the observed gas is a mixture of carbon dioxide, nitrogen and a percentage of oxygen that is below the normal. The mixture may or may not contain methane. The depleted air (nitrogen and oxygen) will have a specific gravity

less than that of normal air, while the specific gravity of carbon dioxide is much greater and that of methane much less.

Owing to the presence of the carbon dioxide and excess of nitrogen, it would be difficult to observe any cap on the lamp, even if methane was present in considerable quantity. Such a mixture is known as "flashdamp," owing to the quick disappearance of the cap immediately after it is formed. The mixture is extinctive of flame, because of the presence of the extinctive gases, nitrogen and carbon dioxide, and a percentage of oxygen below the normal. Its position in the roof is largely, if not wholly, due to the higher temperature of the mixture and the action of the air setting in at the floor from the main entry, as previously described. This condition frequently occurs in coal mining.

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### Broken or Missing Strands in a Hoisting Rope

Kindly answer the following questions in COAL AGE:

1. Is a six-strand wire rope in which one or two strands are missing five-sixths or four-sixths as strong as it was when it contained all the strands? Or, in other words, is it safe to assume that the strength of a wire rope decreases in direct proportion to the number of strands?
2. Again, can a strand be run into a rope to replace one that has come out and the rope be as strong as it was originally?
3. Is it good mining practice to use a wire rope with one or more strands missing?

T. H. WILLIAMS,  
Inspector of Mines.

Fernie, B. C., Can.

1. When one or more strands of a wire rope are broken or removed the rope is unable to resist the strain to which it is subjected, with the same effectiveness, because the strands do not support each other equally as well as when all are present. For this reason, the strength of the rope decreases more rapidly than the ratio of the number of strands it contains, and any estimate based on the former assumption would be unsafe.

2. It is not possible to run a strand into a rope to replace one that has come out and obtain thereby the same strength as possessed by the original rope. This is especially true if the rope has been used for any length of time after the failure or removal of the strand or strands. It will generally be impossible to lay in a strand in a rope in place of one that has been removed so that the new strand will take its due proportion of the load. In most cases such a strand will have a tendency to work out of its place under a load when the rope is in use, owing to the crowding of the other strands.

3. In good mining practice, a rope with one or more strands broken or missing should not be used for hoisting in a shaft. In case of failure, the use of such a rope after its condition was known, if such fact was proven, would render a company liable for the results of the accident.

## Examination Questions

### Pennsylvania Bituminous Mine Foremen's Examination, April 6-8, 1914

*Ques.*—State the chief causes of accidents in bituminous mines, from falls of coal, slate, roof and sides.

*Ans.*—Accidents from falls of roof, slate and coal are due chiefly to the neglect on the part of the miner to promptly timber the roof beneath which he is working and to sprag the coal when undermining the same. The failure to carefully inspect the roof of his working-place before proceeding to load out the coal shot down the night before is a frequent cause of accidents of this nature.

At times a sudden fall of roof in a place or fall of coal at the side or face of a breast is due to the pressure of gas in the strata or the seam. This gas pressure often finds access to a crevice in the coal or to an interfoliated space in the roof strata and becomes distributed over a considerable area and is sufficient to break down the roof or the coal.

*Ques.*—State briefly the legal duties of a mine foreman and assistant mine foreman.

*Ans.*—Briefly stated, the mine foreman is required by law to devote his whole time to the charge of the mine when in operation; to keep a careful watch over the ventilating apparatus, airways, travelingways, timbering and drainage of the mine; to see that all stoppings are properly built and cut-throughs made in all room and entry pillars; to measure the air at least once every week at or near the main-intake and return airways and in the last crosscut of the inby room on each entry and the last crosscut in each pair of entries and to record these measurements in a book kept for that purpose; to remove all dangers observed or reported to him as promptly as possible; to see that a sufficient quantity of all needed supplies of timber, iron, brattice boards and cloth, nails, spikes and tools are kept constantly on hand and delivered to the workmen as required.

The mine foreman or his assistant must visit each working-place in the mine at least once every day while the men are at work and carefully inspect all pillar workings, haulage roads, airways and abandoned places in the mine. He must give all needed instruction to the miners in his charge, in respect to mining and blasting the coal and timbering their working-places. He must see that the mining law is fully obeyed. He must enter and sign with ink, in a book kept for that purpose, a report each day stating the condition of the mine and any dangers he may have found to exist therein. He must read carefully and countersign with ink the reports of the firebosses. Once each week he must report to the mine inspector any fatal or serious accident occurring in the mine and any violation of the mining law or mine regulations.

Assistant mine foremen are required by law to assist the mine foreman in complying with the mining act and in his absence to perform his duties.

*Ques.*—What are the necessary supplies to be kept on hand at the mines for safety, and what action would you take in case such supplies were not provided?

*Ans.*—To insure the safe operation of the mine, it is absolutely necessary to keep an ample supply of timber of all sizes required in the mine, also brattice boards and cloth, nails and tools. There should always be kept on hand a sufficient supply of approved safety lamps that can be used in case of an emergency. At all gaseous mines requiring the use of locked safety lamps, there should be an ample supply of such lamps of an approved type sufficient for all the workmen. There should be at every mine one or more "first aid" outfits, including one or more stretchers and woolen and rubber blankets. A suitable ambulance should also be provided for use when necessary.

Whenever any of these supplies are insufficient for the requirements of the mine, it is the duty of the mine foreman at once to notify the superintendent and to withdraw the men from the mine until the needed supplies are furnished and on hand, as required in Sec. 1 of Art. 3 of the bituminous law.

*Ques.*—What observations would you make on your daily examination of the working-places, and what special attention must be given to pillar work?

*Ans.*—When inspecting a working-place, the mine foreman must examine carefully the condition of the roof to see that there are no slips, fault-lines or other weak places to render it unsafe. He must observe all timbers on the road and at the face to see that they are properly set and in good condition. In like manner he must examine the face of the coal and see that it is properly spragged and safe. He should observe what coal has been shot down and note its condition, so as to enable him to give the miner any needed instructions in regard to loading or blasting the coal. He must note the presence of any gas in the place and see that the ventilating current is conducted in such a manner as to sweep the face. When drawing pillars special attention must be given to the roof to see that it is properly supported over the men. It is important to keep the work in line.

*Ques.*—What material would you use in the construction of stoppings on main entries, cross-entries and room cut-throughs in order to comply with the requirements of the law and maintain the air currents at the face of the workings?

*Ans.*—The law requires that new stoppings between the main-intake and return airways in *all* mines and new stoppings in cross-entries in mines generating explosive gas shall be built of masonry, concrete or other incombustible material. The same rule applies to rebuilding old stoppings. Timber stoppings may be built on the cross-entries in nongaseous mines. Temporary stoppings in rooms may also be constructed of timber or brattice cloth. All stoppings must be kept in good condition so as to keep the air current at the face of the workings.



## Book Reviews

**COAL CATECHISM.** By William Jasper Nicolls. Pp. 235+14 index; 4½x6½ in. No ill. J. B. Lippincott Co., Philadelphia, Penn. Price \$2, flexible leather.

Perhaps some people do not object to the catechism as a way of imparting information. That is a matter of taste, and a book is valuable or not according to the material it contains and the judgment used in its selection regardless of the manner of presentation chosen.

We think this book stands the test well, seeing that it is intended for "that great number of intelligent readers who have no technical training." It is in nearly every case accurate as it can be made without entering exhaustively into details. The "volatile matter" in coal, however, it says "consists of gases—viz., hydrogen, nitrogen and oxygen. The combustion of these gases is seen in the flame when the coal is burning." This embodies several errors, some of which are not due merely to excessive condensation. For there is a volatile matter given off below boiling point which is wholly incombustible, and that evolved material commonly known as "volatile matter" can by no means all be burned. Much is steam and carbon dioxide. The volatile matter is not a gas in the coal, but a solid, and the gases are not merely evolved, but formed under the action of heat. Possibly neither hydrogen, nitrogen nor oxygen is driven off as an uncombined gas, and if the nitrogen were it would be incombustible.

### Does Anthracite Give More Heat than Bituminous Coal?

The writer of the book has a most difficult time comprehending the nature of volatile matter. In answer to question 229, he says, "The richer a coal is in fixed carbon the greater is its heating power." The next answer says, "Anthracites would class higher in value than bituminous coals, weight for weight, owing to the higher percentage of fixed carbon which they contain." In the next answer he gives the evaporative power of Pennsylvania anthracite at 15.56 lb. of water per pound of fuel, whereas he adds, in the next answer, that the power of the best Scotch coal is fixed at 7.74 lb. and that of the best English bituminous at 9.07 lb.

One could not well ask for a better evidence of the faith in carbon of William Jasper Nicolls. But he begins to hedge and admits in the next answer that these laboratory experiments "are not sustained in actual practice or commercially." Then follows a remarkable answer which summarily removes the work of Julius Thomsen at a bound and simplifies thermodynamics marvelously. "It has been proven," he says, "that the heat value of fuel is proportional to the quantity of oxygen which enters into the combination, whatever may be the nature of the combustible. As hydrogen and the gaseous products of its combination with carbon consume much larger proportions of oxygen than the same weight of solid carbon, the presence of these increases the heating power of the fuel."

What wonder then that the author asks, "By this rule which coal would class the higher in value?" And answers, "The heavy gas coals would class higher in value than the anthracites, weight for weight, owing to the higher percentages of gaseous matter and volatile substances which they contain." But again he assures us that his new theory does not work out any better than the old. He says, "We learn that a coal may be high or low in volatile matter or fixed carbon in its chemical analysis and give entirely different results in practice than such determinations would indicate."

After turning over the pages we arrive at question 548; and we have the first statement repeated, "Theoretically, anthracite would be as much better than the bituminous coal as it exceeds that fuel in fixed carbon." Amazing! This is tantamount to saying volatile matter is theoretically as little heat-giving as ash.

But having claimed so much theoretically, he surrenders his whole point, saying, "This" [the superiority of anthracite] "is not the case. Either from the difficulty of combustion or the inefficiency of the mechanical appliances at present in use for generating steam, the excess of carbon in anthracite is not utilized and, generally speaking, a ton of bituminous coal will generate as much, if not more, steam than an equal ton of anthracite."

Now the probabilities are that anthracite coal has been more efficiently used in the past than bituminous and that the reason why it does not give better results than some

soft coal under a boiler is because it does not have an equal number of thermal units per pound of fuel.

We would not have taken so much space in exploiting the errors of this writer had not ideas like his been extremely common, having been heard on the street and found in books for years. The fact is, some bituminous coals—usually those which are low in volatile matter—give out more heat when completely burned than anthracite. This is true both theoretically and commercially.

Judging by the statement that anthracite will evaporate 15.56 lb. of water, the author's authorities evidently assumed that Pennsylvania anthracite would generate in a calorimeter 15,000 B.t.u. The pure coal substance would do as much if it could be obtained, but anthracite as found is not by any manner of means so calorific. Assuming, however, that it is, theoretically it would evaporate 15.56 lb. of water from and at 212 deg. Practically it would do no such thing.

### Practical Tests of Relative Fuel Efficiency

Unfortunately the Technological Department of the U. S. Geological Survey did not test anthracite under its boiler at St. Louis, Mo. It did, however, test several bituminous coals and evaporated the equivalent of as much as 10.22 lb. of water from and at 212 deg. per lb. of actual fuel. Authorities are of the opinion that better results are obtained under the most favorable conditions.

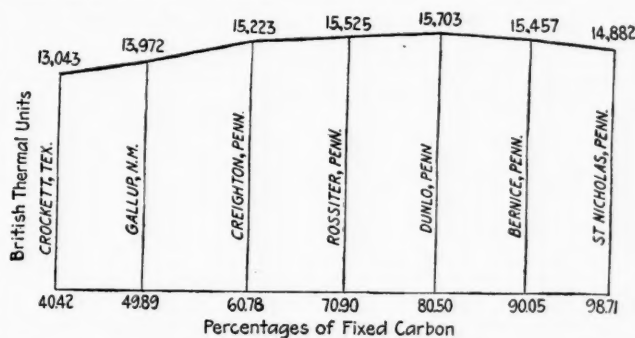


CHART ROUGHLY SHOWING RELATION BETWEEN THE HEATING POWER OF PURE COAL SUBSTANCE AND ITS FIXED CARBON PERCENTAGE

In fact in the Transactions of the American Society of Mechanical Engineers, Vol. IV, p. 267, it is stated that the equivalent of 11.53 lb. of water from and at 212 deg. has been evaporated per pound of Welsh bituminous coal, and even with Pittsburgh Third Pool lump the equivalent of 10.47 lb. has been thus evaporated. It is unfair, therefore, to make the following statement in answering question 232: "A pound of the best Scotch coal by the same experimental tests"—laboratory experiments are evidently meant—"evaporated only 7.74 lb. of water and of the best English bituminous only 9.07 lb." For these experiments could not be similar to those which showed Pennsylvania anthracite as having an evaporative capacity of 15.56 lb., and, moreover, they are experiments bettered in actual practice by many bituminous fuels. The best result we have been able to find with anthracite coal is 9.57 lb. per lb. of fuel.

### How Theory Is Corroborative of the Above Tests

As a matter of fact carbon is not nearly as heating on combustion as hydrogen, the ratio being roughly 15 to 62. If, however, the hydrogen in the volatile matter of a fuel is so combined that it may be regarded as partly burned into hydroxide, as is the case in high-volatile coals, then it is of little or no account. The high-carbon coals such as the "low-volatile coal," so called, with less hydrogen of this kind, are the better for its absence. The even higher-carbon coal—anthracite—is also better for the loss of such ineffective hydrogen.

The best coal of all is one that has lost the partly burned hydrogen and the partly burned carbon and has its hydrogen in light chemical bonds, so that in its combustion all, or more than all, the heat is generated which would be

furnished by the combustion of pure hydrogen alone. In fact, the best coal is the happy mean between a fairly pure carbon coal and one which is high in volatile matter. Still there are exceptions where the volatile matter though still large in amount is of exceptional heat-giving qualities. Such coals are the cannels whenever they are happily free from high percentages of ash.

#### Description of Chart

The chart on the preceding page has been prepared for this review to illustrate the fact that the best coal substance is a semibituminous fuel such as that from Dunlo, Penn. The coal substance from Bernice or St. Nicholas, both in Pennsylvania, though higher in fixed carbon, does not have an equal heat efficiency. That from Rossiter or Creighton, in the same state, containing in both cases less fixed carbon, is also less efficient as a heat producer than the coal substance from Dunlo.

By coal substance is meant an imaginary material made by eliminating the moisture and ash in the coal. The whole heat of the fuel is ascribed in the chart to this coal substance and the percentages of fixed carbon and bituminous matter are recalculated so as to add up to 100.

#### Some Other Criticisms

The other inaccuracies in the book we pass over rapidly. In question 59 we are asked to locate the largest coal basin, and the reply is, "It extends west from the Allegheny Mountains to the Missouri River, a distance of about 1500 miles, and south from the Lakes to the mouth of the Ohio River, about 600 miles." The word "basin" here doubtless means "original basin," but why the coal in West Virginia, Virginia, Tennessee and Alabama and other states is excluded despite continuity of deposit is indeed hard to see. Why include Illinois, Indiana, Michigan and Iowa if these others are to be omitted, for the central coal fields are no longer continuous with those in Pennsylvania?

In questions 152 and 153 the ratio of production between the Wyoming, Schuylkill and Lehigh regions is given as 50, 35 and 15. This proportion was never even approximately correct, but the nearest approach was perhaps in 1878, when it was roughly 49, 32 and 19. In 1913, it was 58, 29 and 13. In question 258 the vexed problem as to whether a bed of coal should be termed a vein or a seam is discussed. We are strictly neutral. We have never been able to see how the vein in a man's arm is less suggestive of a coal bed than the seam of the coat which more or less exactly follows the vein. A seam is a long, narrow, threadlike body just as is a vein. Why in a spirit of pharisaic literary purism make a potter about a difference which really has no existence?

In question 319 the writer describes the method of mining in a bituminous mine and carefully explains how a squib, iron needles and iron tamping tools are used and how coal dust is used for tamping. The purpose of such a book should be to describe good practice and not such methods as violate the law. Of course, squibs are not illegal though they are not advocated, but the use of iron needles, iron tamping tools and coal dust is forbidden in most states.

In answer to question 332 we are told that carbon monoxide has the faint fragrance of violets. It may be so; we would not like to give it a nasal test, seeing that less than 1 per cent. kills in a few seconds. We are told in answer to question 342 that about 3 per cent. of sulphureted hydrogen "is all that is necessary to cause death." An excellent authority, Lehmann, puts the percentage causing rapid death at 0.1 to 0.2 per cent., about  $\frac{1}{20}$  of the figure just quoted.

In answer to question 348 we find that the average of fatalities among miners by gas explosions and otherwise is one miner for every 100,000 tons. The Bureau of Mines estimates that one life was lost last year for every 208,078 short tons produced. The loss of life has never approached the level of one man per 100,000 tons. In 1907, for instance, the year when mine fatalities reached their zenith, the rate was one man per 144,325 tons.

A foot-pound is, as stated in answer to question 523, "a unit of work." It is not a rate of doing work. It is erroneous to state, as in the text, that it is "the energy exerted in raising or lifting one pound in weight one foot high in one minute," for the time during which the work is achieved is not a point at issue.

In answering query 525 the unit of heat is the Fahrenheit degree; on the next page, without a statement to explain the difference, the Centigrade degree is taken. Thus the coal in one case generates 14,500 "heat units" and in the other only 7500 "heat units," and the author does not help the reader to a realization that the two coals are only 1000 B.t.u. different in value and that only the units of measurement are really different.

In the answer to question 626, the writer takes the old-fashioned view that coke should be bright and silvery. As a

matter of fact, much of the best product of the byproduct oven cannot be so described, nevertheless it is equal to the best. Of course, the author favors coke as a fuel because it contains so much carbon. He overlooks the fact that the volatilization increases the ash percentage considerably to the detriment of the heating power and in some cases removes much valuable hydrogen.

We would not spend so much time checking these errors did we not know that this book has gone far afield, has been reviewed in foreign technical journals and has seen three editions. Nor would we even then give so much space to mere comment. The errors we have pointed out are common, and they may as well be met with this readable book as a text as be given place without such reference.

THE MAN WITH A JOB. By Wightman D. Roberts, Huntington, W. Va. 16 pp.;  $\frac{3}{4}$  x 6 in. Price 10c. Stiff paper cover.

There is need for much literature such as is found in this little booklet. Only we wish Billy Sunday or some novelist had written it. If only Frédéric Bastiat were still alive, who wrote such wonderful little tracts of this sort for the French Government, or if Maria Edgeworth were still living, what might not be written on such a subject. But they are not, and this little book occupies the field all alone.

In the first chapter, the miner talks about the casting of all jobs into a "jack-pot" under a socialistic government. But, as these workers believe, however untruly, that any other job is better than coal mining the idea of exchanging it will not terrify them. Then he reviews the fact that all occupations have their drawbacks, usually much exaggerated, it is true, but all are far less delightful than the life seen in our visions.

#### Not Freedom, but Only a Change of Masters

In the second chapter the miner discovers that instead of being free under socialism he is only to change masters while his property is to be divided up among the deadbeats. He is struck by the fact that he has no future to work for and that life will be a deadly level. He says that if he doesn't like one company now, he can wander off to another. But in the socialistic days, if they come, he must grin and bear conditions as he finds them. There will be only one commonwealth, and if he is elected to a bad place in the mine, elected he will be without opportunity for change. He will be like a minority stockholder in a big corporation—unable to change conditions, for his vote won't count. He won't be able to get up and "beat it" to a place where conditions are better.

Then again, if any men decided to quit work entirely, what would be done to change their decision? If the government then took care of those men there would be no incentive for them to work. It will be a choice between "Let George (the man who is willing to work) do it" or else the application of force. Either the lazy will do as they please or government will have to make convicts of them. The lack of opportunity will take the ginger out of all of us.

#### After All, the Coal Is Not Going to Dig Itself

Of course we might rise to be bosses and managers, but the miner recalls that bossing is just what he has been denouncing for years. And as the miner thinks it over he is sure that the coal is not going to dig itself. The drudgery has yet to be done. In the last chapter the miner concludes that though he has not now all that he wants, the change is not likely to better him.

Liberal discounts are given for large numbers of these books. If a list of persons is furnished, copies will be sent direct to them from Huntington, W. Va.

This little book has received the most favorable comment from mine officials. J. J. Ross, general manager of the Logan Mining Co., writes us personally indorsing it and saying that his company has distributed many copies. All the members of the Kanawha Operators' Association expect to use it, and it has already been distributed by the Consolidation Coal Co., the Hutchinson Coal Co., the Carbon Coal Co., the West Virginia Colliery Co., the Republic Coal Co., the Slab Fork Coal Co., the Columbus Iron & Steel Co. and the West Virginia Pocahontas Coal Co.

ELECTRICITY IN COAL MINING. By David R. Shearer. pp. viii + 80 + 4 index. 6x9 $\frac{1}{4}$  in. 28 ill. McGraw-Hill Book Co., Inc., 239 West 39th St., New York City, 1914. Price \$1.50, cloth boards.

This book treats on the application of electricity to signaling, haulage, coal-cutting, ventilation and pumping and is probably as complete as can be compressed into 80 pages with illustrations. Some elementary facts relative to electricity appear in the earlier chapters and information is given as to power equipment and repair shops. In the appendix are valuable tables and other useful data.



# Coal and Coke News

## Harrisburg, Penn.

Legislative investigation of the allegations that anthracite coal producers and retailers have been making extortionate charges for coal under the guise of the state anthracite tax was determined upon at a conference between Governor Brumbaugh, members of the Republican platform committee of the two houses and the chairmen of the appropriations committees on the state revenue situation.

The primary object of the conference was to secure an agreement on revenue-raising measures and it is believed that about \$5,000,000 can be secured for highway improvement by enactment of proposed laws, among them being the anthracite tax bill, but which is in danger of being killed by the members of the nine anthracite counties, if a 50-50 division is not made.

Resolutions calling for the investigation will be presented at an early date. This investigation will go into the sales of coal producers and retailers, which according to reports received here from time to time have been made at prices far in excess of what would be justified by the state tax.

Attorney General Brown in telling about the conference said.

The conference felt that a division of the anthracite tax, 60 per cent. to the state and 40 per cent. to the anthracite counties would be fair. The tax proposed in the pending bill is about 5 cents a ton. At this rate the gross amount of revenue would be about \$4,500,000. The conference discussed the advisability of increasing the tax to about 7½ cents a ton (the bill reads 2½ per cent ad valorem), which would bring in \$7,000,000 a year. The state would have to take out 1 per cent. of its share for collection.

The conference decided that a state commission would be created to investigate the charges that anthracite coal prices have been raised exorbitantly because of the tax. This commission would also look into any future extortionate rates. It and the state would fight any attempt to increase the price per ton to a larger sum than the regular selling price of coal with the tax added. We would resort to the use of bulletins, sent broadcast over the state, and to first page advertisements in newspapers if necessary.

The governor and his attorney general will hold a conference with the representatives of anthracite districts during the latter part of the month. The governor is willing to grant 40 per cent. to the anthracite counties, and the state to pay all expenses incident to assessing, collecting and distributing the tax. The anthracite districts will receive 40 per cent. net. The Governor figures the counties producing anthracite will receive 11 per cent. of the 60 per cent. the state receives, and arrives at this through a study of the highway maps of the state. He is desirous that the Legislature act quickly on the bill and put it through. The members of the Senate and the House, contend that as the coal companies in selling surface rights "reserve everything but the wind" and there is no redress to the municipality or individual property owner for loss which may be occasioned by mining operations, the municipalities should receive 50 per cent. of the tax. Some members think the distribution should be made on the basis of production rather than population of the municipality.

### Bituminous Miners and Compensation

A bill designed to bring the bituminous miners of the state under the provisions of the proposed workmen's compensation act has been presented in the Senate by Senator Martin, of Clearfield. The bill is somewhat similar to the one now before the Legislature, presented by Representative Dawson to bring the anthracite miners under the proposed law.

Under the present law mine foremen must be selected from among men who have been granted certificates by the state. Under state rulings coal companies are not responsible for the acts of mine foremen because the companies did not have the right of free selection of the men. Under the bill presented by Senator Martin the company may select foremen without regard as to whether they have certificates or not and mine employees are brought under the direct supervision of the operators.

Representatives of the United Mine Workers are confident that the Catlin bill to bring miners under the workmen's compensation act will pass the senate at an early date. Numerous conferences have taken place during the week between miners, operators and senators on the committee of mines and mining. Senator McNichol has stated that the Legislature will not adjourn on May 5 if the Catlin bill is not passed.

A bill to amend section 1 of article 8 of the Act of June 1911 applying to bituminous mines has been introduced by Representative Milliron, to give the mine inspectors power to compel the adoption of such safety and locking devices on cages used in lowering and hoisting persons as will prevent the accidental tipping of cages.

A bill which makes many changes in the miners' certificate act of 1897 has been introduced by Mr. West of the Mines and Mining Committee, the amendment (Section 5) reads as follows:

That it shall be the duty of each board to meet once every month and not oftener, and said meetings shall be public and if necessary the meeting shall be continued to cover whatever portion may be required of a period of three days in succession and examine under oath all persons who shall desire to be employed as miners in their respective districts and the said board shall grant such persons as may be qualified, certificates of competency or qualification which shall entitle the holder thereof to be employed and to do the work of a miner as may be expressed in the said certificate and such certificate shall be good and sufficient evidence of registration and competency under this act and the holder thereof shall be entitled to be registered without an examination in any other of the anthracite districts upon payment of the fee herein provided.

All persons applying for a certificate of competency entitling them to be employed as miners shall be not less than 21 years of age and shall have had at least two years' experience as a miner, miner's laborer or a man of general work in the coal mines of this country or of other countries and in no case shall the applicant be deemed competent unless he appear in person before the examining board to answer 12 questions in the English language pertaining to the requirements of a practical miner. He shall demonstrate that he understands the use of safety lamps, knows how to handle explosives and is competent to do the work of a miner without injuring his own life or the lives of others.

Said boards shall keep an accurate record of the proceedings of all its meetings and in said record shall show a correct account of the examination of each applicant with the questions and their answers and at each of its meetings the board shall keep such record open for public inspection. Any miner's certificate granted under the provisions of the act or any prior acts shall not be transferable to any person or persons whatsoever and any transfer of the same shall be deemed a violation of this act. Certificates shall be issued only at meetings of said board and said certificates shall not be legal unless then and there signed by at least three members of said board.

Senator Lynch, of Lackawanna County, has introduced a bill to regulate the mining out and removing of coal under streets, alleys, public highways, etc., in the anthracite region.

The bill provides that any municipality in the anthracite region may create a Bureau of Mine Inspection and Surface Support, with a practical mining engineer in charge. The bureau is to have the right and power to enter and inspect, examine and make surveys in any mine at any time, and to take such persons as may be necessary for such examinations, surveys, etc. The bill provides that every operator shall within three months after the passage of an ordinance by any municipal corporation creating a Bureau to furnish the Bureau with an accurate map of the mine workings on a scale of 100 ft. to the inch, and place thereon the extensions made at least once every three months.

The proposed law prohibits any mining under streets, alleys, etc., to such an extent as to remove the necessary and adequate support of the surface against subsidence, without first having built sufficient, adequate and permanent artificial support in such place to maintain and preserve the stability of the surface. Before the coal is removed the operator will be compelled to give 30 days' notice to the bureau of its intention to so remove the coal under the streets, etc., the Bureau is given power to apply for injunction to stop mining under any street, but must give the operator written notice of its intentions, at least 24 hours before application is made.

A bill to increase the salaries of the mine inspectors of the state from \$3000 to \$4000 per annum has been introduced by Representative Evans.

Until the governor declares his purpose in withdrawing the Tenor appointments as commissioners to the Public Service Commission his intentions will not be known. But it is a good guess that he contemplates something out of the ordinary. If he were satisfied with the constitution of the commission or its personnel he could have left the appointments undisturbed. The senate has not yet confirmed them.



## PENNSYLVANIA

## Anthracite

**Tamaqua**—The Nesquehoning breaker of the Lehigh Coal & Navigation Co. is turning out 500 tons of coal each operating hour.

**Beaver Brook**—The Duggan stripping operations were tied up on Apr. 14, by a strike of 200 employees. They claim that the owner, Harry Duggan, of Hazleton, had refused to meet the committee that demanded the payment for two shifts worked in March.

**Larksville**—Many houses were damaged, water and gas mains were broken and damage to the extent of thousands of dollars was done by a cave-in in the Bennett and Cooper veins of No. 5 colliery of the Delaware & Hudson Co. on Apr. 15. The caved district takes in about two acres in which there are many deep holes and depressions. A number of homes were badly wrecked. The home of Thomas Temperine was broken in two by the cave-in and is a total wreck. The cave-in twisted and turned over buildings on their foundations and some of the structures are greatly tilted. Walls and partitions of the buildings have been damaged so badly that they can never be repaired. The bursting of the water mains caused the company to cut the supply, and all fires in the cave-in area were ordered quenched and all lights ordered extinguished.

**Carbondale**—Charles Enzian, of the Federal Bureau of Mines and City Engineer Saxe, of Carbondale, estimate that it will cost \$90,000 for the proposed attempt to smother the mine fire that has been raging under the city for a number of years.

## Bituminous

**Jumbo**—In a suit against the Pittsburgh Coal Co., Amelia Janofski, seeks \$10,000 damages by reason of the death of her husband, killed in a mine of the defendant coal company. The accident occurred on June 9, 1914. Acting under instruction, it is averred, the husband was sent into a part of the mine to work that was dangerous. It is averred that prior to the day her husband was killed there had been various falls of roof which fact, it is claimed, was known to the defendant company. The husband of the plaintiff was caught by the fall of a large piece of rock and crushed to death. It is alleged that prior to the accident the mine foreman had promised to send a crossbar to prevent the roof from falling, but failed to do so.

**Fredericktown**—As the result of rioting, in which women were leaders, around the mines of Vesta No. 5 of the Vesta Coal Co., at the opening of the mine recently, after a long shutdown, 20 men, 13 women and 7 babies were lodged in the county jail. The trouble arose over the company's action in discharging John Dale, a check weighman and an employee whose dismissal is decided by the union. The company has agreed to take back the discharged weighman, and that eviction notices to seven miners' families whom the company had refused to allow in its employ should be withdrawn.

**Meadowlands**—The mine of the United Coal Co. recently began operations with large orders for lake shipments. During the past few months this mine has been operated three to four days per week with only about one-half the plant in active operation. The prospects are good for active work throughout the entire summer.

**Pittsburgh**—The caving of old mine workings recently caused two houses in Climax Street to settle so that the doors had to be forced open in order to extricate the occupants. At five o'clock in the morning the tenants of these houses were awakened by jarring and rumbling. They tried to escape, but the doors could not be opened. An investigation showed that the land had settled several feet, due to collapsing of old mine entries under the property.

**Connellsville**—The weekly production of Connellsville coke recently attained 292,000 tons with shipments aggregating 288,000 tons. It is thought that the 300,000-ton mark will be reached before May 1. There have been practically no idle ovens fired recently, but the running time of those in operation has increased.

## WEST VIRGINIA

**Mason**—About 300 men working in the mines of the Hutchinson Coal Co. are on strike, as the result of a difference of opinion regarding the driving of entries. The company wanted several entries driven, and agreed to let any man who wished to do so work them, furnishing all the cars needed in order to facilitate the work. The men working in the mine proper objected to this, for the reason that they did not get as many cars as the men working the entries, and the strike resulted. Union officials are endeavoring to adjust the matter.

**Huntington**—Operators representing 75 per cent. of the coal-tonnage production of West Virginia were present at a meeting here on Apr. 12, at which the West Virginia Coal Association was organized, for the purpose of promoting the interests of the industry in the state in every way possible. A permanent organization will be perfected on Apr. 30, a constitution having already been formulated and sent out to various district associations for ratification. J. W. Dawson was temporary chairman, and A. H. Land secretary of the meeting.

Betterment of market conditions and plans to decrease fluctuations in price were discussed at a recent meeting of coal operators from the high volatile field. This meeting followed the adjournment of the session of the West Virginia Coal Association. Although state operators generally declare that bad working conditions are universal, the condition of the splint gas-coal market is said to be especially bad because of the keen competition and the unsteady condition of the market.

**Roderfield**—Three men were killed in a mine of the Davy-Pocahontas Coal Co. Apr. 17, when a pocket of gas was exploded by a shot. Only six of the 200 miners usually employed in the pit were in it at the time of the explosion.

**Elverton**—The Branch Coal Co. recently suffered the loss of its power house and a portion of a trestle by a fire which originated in the engine room. This loss it is thought will reach \$25,000, but was fully covered by insurance. The company will begin immediately rebuilding and expects that work will be completed in 30 days.

**Bluefield**—A persistent rumor is current throughout this section that an effort will be made, or rather is already underway looking to the organization of the coal miners. It is said that parties other than the miners are promoting a movement to have the miners organize. It is believed that the present is a most inopportune time for such a movement. At no time in the field's history could the mine managers better afford to close up shop than at the present.

**Fairmont**—The Annabelle mine of the Four States Coal & Coke Co. recently began operations with a force of 650 men, after a shutdown of several months. It is stated by company officials that more miners are needed and that within the next few days 300 more men can be employed. During the past five months the miners at the Annabelle plant worked only 23 days. The opening of the Lake trade giving an outlet for shipments caused the resumption of operations.

**Montgomery**—March coal loadings were far below normal in the Kanawah and New River fields, and the month was a discouraging one for local operators. There was a gain of 30,000 tons over February in the New River district, but a loss in the Kanawha district of 30,000 tons. Compared with March, 1914, there was a loss of 157,000 tons in the two districts. It is believed that conditions through April will show improvements, as all mines in both districts have been working a little better thus far.

## ALABAMA

**Birmingham**—The Committee named by the State Legislature to look into the matter of conditions at the camps employing convict labor, with the view of abolishing such labor in the mines, made a recent investigation of the conditions at all convict camps, and reported that existing conditions were not as bad as reported, that sanitation conditions were good; that the food was clean and wholesome, and that their investigation failed to find that convicts had been cruelly treated.

## KENTUCKY

**Whitesburg**—Coal shipments from the McRoberts-Fleming coal field of Letcher County have increased greatly since the 10th of the month. The Lexington & Eastern is now carrying out from 125 to 150 cars per day—this to be increased to about 200 cars May 1.

A big party of coal operators, capitalists and others, including Congressman Slem; W. S. Dudley, of Carlisle, Ky.; John E. Buckingham, of Paintsville; Johnson N. Camden, and others, have just completed an inspection trip over the Letcher-Perry coal fields especially along the North Fork extension of the Lexington & Eastern R.R. With the party were a number of West Virginia operators who it is said are projecting leases of certain of this land.

**Hazard**—The Lexington & Eastern announces that more coal was shipped over that road from the Perry County coal field the past week than in any previous week in the history of its development. There has been much improvement in market conditions owing, it is said, to the opening of the markets of the Lake region.

## OHIO

**Brilliant**—The tippie of the Dexter Coal Co.'s mine was destroyed by an incendiary fire Apr. 14; this put 135 men out of work. It will take some time to rebuild the tippie, and whether or not it will be rebuilt at all is not known, as the mine has not been operated at a profit.

**Bridgeport**—It has been estimated by one of the officials in charge of the strike of eastern Ohio coal miners that over 25 miles of fences will have to be constructed in Belmont county by striking miners to surround their community gardens. These gardens have been started in many mining camps, and it is the intention to raise vegetables and field products during the coming summer. Large Chicago and Pittsburgh wholesale seed houses have promised to extend every assistance to the miners and their officials.

Gen. Jacob S. Coxey, best known as the head of "Coxey's Army," has secured an option on the mine of the Neister Coal Co. at Thrashing, Ohio, for 20 days, at a price said to be about \$100,000. It is reported that Gen. Coxey intends to take up the option and operate the mine on a cooperative basis.

**Gloucester**—At a meeting of officers of the Sunday Creek Coal Co. and representatives of the miners' union held here recently, to discuss the matter of loading "dirty coal," it was declared by the union men that any man following this practice would have to stand on his own responsibility, as the union would not support him. One of the points made by the operators in opposing the mine-run law in Ohio was that under it men would load dirty coal, thus rendering the product unmarketable, but the union men took the position that this was an unwarrantable charge. Now that it has happened, as the operators assert, they look to the union to break up the practice. It is especially important to the operators that it be eliminated at this time, as only the best coal can be marketed.

**Stuebenville**—Fire destroyed the tippie of the Dexter Coal Co. at Brilliant, Ohio, last week. The origin is believed to be incendiary.

**Columbus**—Only slight opposition developed in the Ohio Senate last week to the enactment of the Moore bill, giving coal companies the right of eminent domain. The bill gives coal companies the right to condemn a right-of-way through private property when necessary. The bill now goes to the House of Representatives for consideration.

**Roseville**—The Elk Coal Co. has settled its differences with the 140 men employed in its mine and the latter have gone back to work. The suit brought by the company against the union and its officials for \$25,000, for breaking their contract and closing the mine by striking, will be dropped. The union charter of the men, which was revoked on account of their unauthorized strike, has been restored, and the miners' attachment suit for \$4000 in wages has also been dismissed.

## ILLINOIS

**Edwardsville**—An unusual action was taken Apr. 16 in the Madison County Circuit Court, when the court gave the defendant's witnesses the option of testifying the way the court suggested, or having the case thrown out. This was a damage action for \$5000 against the Madison Coal Corporation. The defendant witnesses would not state to the court whether the corporation had elected to come under the provisions of the Illinois Compensation Act or not. They declined to identify a notice that they would come under that act, which they had posted on their bulletin. The court said it was a matter of common knowledge that the company had led the miners to believe they would come under that act, and when a suit came up they refused to admit that agreement. There is much dissatisfaction felt among the coal operators in the state over the action of the defendant, bringing into ill repute the operators in general, who support this measure.

**Chicago**—Readjustment of coal and coke rates proposed by the Western railroads in the Western advance rate case were recently argued in the Interstate Commerce Commission's investigations. Large coal operators of Illinois, Indiana, Ohio, Oklahoma and other Middle Western states opposed the proposed rate increases.

**Matherville**—Officials of the Coal Valley Mining Co. recently closed down the Matherville mine, laying off between 150 and 200 miners. Unsatisfactory demand for coal has been given as the cause for this shutdown.

**Taylorville**—The deal for the sale of the Christian County Coal Co.'s mines to the Peabody Coal Co. will be completed in a few days, it is believed. The purchase price is said to be between \$200,000 and \$225,000.

**Farmington**—The new No. 8 mine of the Alden Coal Co. has established a new rate of production which the officials are striving to keep up. The output was recently doubled as compared with a month previous.

**Danville**—Through a petition of the Chicago Continental Bank and Trust Co., trustees of the Bering Coal Co., which became bankrupt several years ago, the sale of the latter firm's property has been ordered because of the inability of the coal company to pay a mortgage and other debts aggregating over six million dollars. Walter C. Lindley, of Danville, has been appointed special master, and the sale will be held at the Federal Building in Danville on May 12.

## MINNESOTA

**Duluth**—John E. Lindgren, John Bergman and August Johnson recently incorporated the Red River Valley Coal Co. for the purpose of exploring and developing coal lands near Crookston, on which it is claimed large deposits of coal, believed to be of higher grade than any yet found in this part of the country have been discovered. These gentlemen have under option about 2000 acres of land and have sunk several test pits. A drill is being placed in operation to thoroughly explore the coal deposits.

## ARKANSAS

**Fort Smith**—According to the report prepared by W. S. Newcomb, of the Southwestern Interstate Coal Mine Operators Association, the Arkansas coal production in 1914 was 299,980 tons less than in 1913. The entire production during the year was 1,643,881 tons as compared with 1,943,861 tons in 1913. Labor difficulties and the increased use of oil for steam purposes are said to be the causes of this falling off in production.

## FOREIGN NEWS

**London, England**—A critical situation has arisen among the coal miners. Representatives of the Welsh miners have unanimously decided in favor of tendering a fortnight's notice of a proposed strike to the mine owners in order to enforce their demands for a 20 per cent. increase in wages. The Mineral Federation of Great Britain will meet shortly to decide what action they will take to compel the mine owners to accede to their demand for a similar increase. That the result of the trouble will be anything like a national strike of the miners is considered improbable, but it may necessitate Government intervention in a drastic manner.

## PERSONALS

C. M. Weld, mining engineer, formerly at 66 Broadway, New York, has removed his office to 60 Broadway.

P. F. Sweeney, a leading mine worker of Shenandoah, Penn., has been appointed a board member of District No. 9 of the United Mine Workers of America.

J. H. Picton was recently offered and has accepted the position of mine manager for the Higbee Coal Co. at Peoria. Mr. Picton will assume his new duties on May 1.

H. McDermott, for the past five years auditor of the Pratt Consolidated Coal Co., has resigned his position to enter other business. His successor has not yet been named.

Richard Peters, Jr., has resigned his position as sales agent of the Producers Coke Co., of Uniontown, Penn., to become assistant to the general manager of the W. J. Rainey Co. with headquarters at 52 Vanderbilt Ave., New York.

Clarence Boyle, Jr., formerly district sales manager of the Taylor Wharton Iron & Steel Co., Connell Bldg., Scranton, Penn., has become associated with Clarence Boyle, Inc., wholesale lumber dealers, 1211 Lumber Exchange Bldg., Chicago.

S. E. Van Horn, formerly assistant engineer of the Delaware & Hudson Co., has been promoted to chief engineer of the coal department of that company, with headquarters at Scranton. Mr. Van Horn has been with the engineering force of the Delaware & Hudson Co.'s coal department for the past 15 years, prior to which he spent a number of years in the engineering department of the Lehigh Valley Coal Co. at Wilkes-Barre.

L. F. Hamilton, in charge of the advertising and specialty department of the National Tube Co., has just returned from an extended trip to the West and Pacific coast in connection with the company's exhibit at the Panama-Pacific Exposition. The National Tube Co.'s exhibit is a part of the U. S. Steel Corporation's exhibit which is located in the Mines and Metallurgy Building and occupies 44,000 sq.ft., being the largest single exhibit at the Exposition.



## OBITUARY

Dr. T. C. Shaffer, surgeon for the Berwind White Coal Co., of Windber, Penn., was almost instantly killed in an automobile accident near Tyrone, Penn., recently. He attempted to avoid another car on the road, as the result of which he lost control of the steering wheel, and turned turtle into a ditch.

John H. Dougherty, one of the pioneer residents of Altoona, Penn., died recently at the home of his son, Clarence, in St. Louis, Mo., where he had gone on a visit. Mr. Dougherty was for many years engaged in business but lately had been developing a 900-acre coal tract at Dougherty, Penn. He was a veteran of the Civil War.

John Bryden, who died at Esquimalt, Vancouver Island, British Columbia, on Mar. 27, was a pioneer coal-mine manager in that province. He was born in Ayrshire, Scotland, on Dec. 4, 1831, so at the time of his death was in his 84th year. In 1862 he left Scotland for Vancouver Island, going by paddle-steamer to America, and via the Isthmus of Panama and San Francisco to Esquimalt and Nanaimo. At the latter place he at once became joint manager with Mark Bate for the Vancouver Coal & Land Co., an English company that had acquired the coal mine opened at Nanaimo about 1851 by the Hudson's Bay Co., which operated it for about 10 years. In 1880 Mr. Bryden transferred his services to the Wellington Colliery Co., a Dunsmuir incorporation that was operating within a few miles of Nanaimo. In 1894 he retired from active mine-management, but continued his association with the coal-mining business interests of the Dunsmuir until the sale of their collieries to the Canadian Collieries Co. (Dunsmuir) Ltd. in 1911.

## INDUSTRIAL NEWS

**Columbus, Ohio.**—Judge Rogers in Common Pleas court has ordered the sale of the property of the Starr-Hocking Coal Co., of which C. E. Haskins has been receiver for several months. The properties consist of coal mines in the Hocking Valley.

**Huntington, W. Va.**—The Allis-Chalmers Mfg. Co. through the Banks Supply Co. has received a large order from the Lincoln Coal Mining Corporation for a generating plant to be erected on Big Creek. The Lincoln Mining Corporation has just recently put its mines into operation.

**Toledo, Ohio.**—The steamer "W. H. Donner" left Toledo on Apr. 16 bound for Milwaukee with 10,000 tons of coal, this being the first shipment to leave Toledo this season. The steamer "Agassiz" began loading immediately after the "Donner" but was not expected to sail for several days.

**Birmingham, Ala.**—The annual meeting of the stockholders of the Sayre Mining & Manufacturing Co., which was due to be held this month, has been postponed until some time in May. It is expected that a complete reorganization of the company will take place at the annual meeting.

**Coaldale, Penn.**—Because the Eastern Pennsylvania Street Ry. allows workmen in mining clothes to ride on the regular trolley cars, despite protests, 37 girls, employed in Tamaqua mills and factories, on Apr. 16 engaged an automobile bus to take them to and from work. They assert that many more will follow their example.

**Pittsburgh, Penn.**—The first shipments of lake coal will go from the Pittsburgh mines to the Northwest about the end of this month. Mines throughout the Pittsburgh district have in the recent past increased production fully 10 per cent. Part of this was due to preparatory shipments to the Lake docks and the remainder to a generally better coal consumption.

**Buffalo, N. Y.**—The War Department has denied the Delaware, Lackawanna & Western R.R. the use of the North Pier for the mooring of coal vessels. Unless the matter is adjusted the company will be unable to load cargoes for Upper Lake delivery this season. Last year several hundred vessels were loaded there and the company has had the use of the pier for the past 50 years.

**St. Louis, Mo.**—In the case of the Dealers Fuel Co. versus the Burlington R.R., judgment was rendered for the plaintiff for \$152 and costs. This is a case wherein the plaintiff notified the defendant to stop coal in transit, and the defendant ignored the order and delivered the coal to a bankrupt. This

decides the right of a shipper to stoppage in transit, regardless of his reason.

**Huntington, W. Va.**—In compliance with orders recently published in bulletins posted by the Chesapeake & Ohio R.R. repair shop, 1700 men, skilled and unskilled, recently started working 9 hr. per day and 5 hr. on Saturday. This is an increase from 35 to 50 hr. per week. It is believed that the Lake coal movement having started, business will be heavy throughout the summer.

**Lorain, Ohio.**—West Virginia coal is to be shipped to this point for the Lake trade, according to plans being perfected by W. T. Lechluder, superintendent of the Cleveland division of the Baltimore & Ohio R.R. The coal will be stored here and shipped as the demand develops. The Lake movement began formally, with the loading of the first cargo. It is expected to be a good season.

**Spokane, Wash.**—The sum of five million dollars, invested in Canadian coal fields by the Count Alvo Alvenselben, of Seattle, will likely be irretrievably lost because the count was unfortunate enough to interest Kaiser Wilhelm in his mining enterprise. The Count, too, is German, and since the war broke out, he has confined his business to this side of the line. He is the dominant figure in the Issaquah and Superior coal districts of Washington.

**Fairmont, W. Va.**—The Federal Coal & Coke Co. has let the contract to F. J. Foye, of Brownsville, Penn., for sinking a shaft near the confluence of Finche's and Heck's Runs. This shaft will be 360 ft. deep and will be sunk for the purpose of giving the mines better ventilation and to secure additional means of escape. Work on the shaft will be started on or about May 1 and will be pushed to completion as rapidly as possible. The cost will be about \$30,000.

**Birmingham, Ala.**—Petitions for reduction in coal rates from Birmingham to Anniston and Selma were recently filed before the State Railroad Commission by the Chambers of Commerce of Anniston and Selma. They desire a restoration of the old coal rates which were granted to certain manufacturing companies. The rates apply to Talladega, Gadsden and Sylacauga. The granting of these rates was one of the issues in the gubernatorial campaign recently held.

**Grafton, W. Va.**—Officials of the Baltimore & Ohio R.R. are of the opinion that all employees of that road will be back at work within a few days. Announcement has been made that an additional appropriation has been received for the Monongah Division engine shops at Grafton for the remainder of this month, and that as a result from 50 to 60 men will be put back to work in the local shops immediately. It is believed that the shipments of coal will increase regularly up until about the middle of June.

**Columbus, Ohio.**—The contracts for building 28 miles on the new line of the Chesapeake & Ohio R.R. from Portsmouth to Columbus, have been tentatively awarded by M. J. Caples, vice-president in charge of construction. The final contracts will be awarded some time during the coming week. The 28 miles extend from Sciotoville to Waverly. The tentative contracts were awarded to W. W. Boxley & Co., of Roanoke, Va.; Winston & Co., of Richmond, Va., and New York; Rinehart & Dennis Co., of Charlottesville, Va., and the Robert Green Contracting Co., of Pittsburgh. Work will be begun within 30 days after the final contracts are awarded.

**Bluefield, W. Va.**—It is believed that never in the history of the Pocahontas coal fields has the industry revived so quickly as it has within the past few weeks, rising from the lowest ebb in years at the end of February to virtually normal conditions by the close of March, and promising to rise above the highest record for any one month in April. The opinion that the coal business of April will exceed normal if not establish a record for the month, is based on the fact that a number of foreign vessels are loading at the Norfolk & Western piers, while the railroad company is said to be working to its full capacity to supply them.

**Charleston, W. Va.**—The list of fatal accidents in the coal mines of West Virginia during the month of March shows a total of 130 fatalities. This, however, includes 112 victims of the explosion at Leyland mine on Mar. 2. From all other causes, only 18 deaths were reported, which would denote a considerable decrease in mine fatalities but for this unfortunate disaster. This report shows 112 deaths as due to explosion, 9 as resulting from falls of roof and coal, 3 from electrocution, 3 from mine car accident, 2 from explosives, and one from miscellaneous. Four deaths occurred above ground. Of the total number of men killed, 45 were Americans, and 85 foreigners. By counties, the fatalities were as follows: Fayette, 115; Logan, 3; Harrison, 2; Marion, 2; McDowell, 2; Mercer, 2; Raleigh, 2; and one death each in Mingo and Preston Counties.



## Coal Trade Reviews

### General Review

**Orders plentiful in anthracite. Improved undertone in bituminous but the situation is still decidedly mixed. Heavy export movement. Better outlook in the Lake trade.**

While anthracite orders are not as plentiful as at the beginning of the month, it is none the less evident that some of the companies are being pushed hard to meet the demand and some orders will be carried through into May. The easing in the money situation has undoubtedly released numerous unexpected orders in all directions. The barge lines to Down East points already have sufficient business on their books to carry them well over into next month. Lake shipping is just starting, having been delayed by unusually heavy ice fields at the Buffalo ports.

Bituminous agencies are expressing every confidence in the intrinsic soundness of the market, but there are so many conflicting tendencies that the situation is decidedly mixed. On the whole the market has steadied up noticeably while there is a decidedly better feeling as regards prices, and no material concessions are noted, though the outlook for any substantial advance continues as indefinite as ever. It is still evident that large steam consumers are taking coal very conservatively, holding shippers rigidly to monthly proportions. Even the agencies handling the high-grade coals are still pressed with excessive tonnage, and buyers have not relaxed any in their disposition to be critical as regards quality. With the disruption in British shipping, our export trade continues to expand in a most impressive manner, particularly to South American ports; an easing tendency in ocean freights is having a stimulating effect on this business.

A further reaction appears to have developed in the Pittsburgh district market. This is commonly ascribed to surplus production at the local mines, but close observers are inclined to lay the blame on other districts where aggressive efforts are being made to force the market. Lake shipping is nominally open, but there is such a large quantity of coal offering, and production is so heavily curtailed that little relief is possible from this source, particularly as there is practically no movement so far. Preparations of the United States Steel Corporation to ship down a large tonnage of ore is creating a more hopeful outlook, and some few boats are already being loaded for the Northwest, but there is considerable coal standing at all of the loading ports, and the movement cannot be of large proportions until late in the season at best. The situation as regards dealers' stocks is rather mixed in Ohio, though further south the disposition to stock up is noted. Steam consumers still maintain they will be able to buy all their requirements in the prompt market and continue holding off on contracts.

The Middle Western situation is generally flat, but there is none the less a notable disposition to maintain prices and curtail shipments down close to market requirements. Contracting is still generally delayed and some of the largest consumers are apparently convinced that this will be a year of low prices. The outlook is none too favorable for even an average volume of business, and interest so far is concentrated on an effort to get profitable prices.

### BUSINESS OPINIONS

**Banks still surfeited with loanable funds but the general outlook is notably optimistic. Well sustained and conservative progress in most lines.**

**Financial Chronicle**—There is little definite change to be noted in the general money situation. Thus far slight, if any, improvement appears evident in mercantile or industrial circles in the requirements for funds to be used in ordinary routine channels of business activities. The banks still are surfeited with supplies of loanable funds. Last Saturday's bank statement (the actual figures, as distinct from the averages) showed a decrease of the nominal sum of \$43,100 in the surplus above requirements, the surplus itself standing at \$148,214,940, which compares with \$18,732,950 a year ago, when the old form of statement was in operation.

**Armour & Co. (Credit Dept.)**—Conditions have improved very materially during the last ten days. An increasing number of furnaces are in blast. Many factories are increasing their output. The number of idle men continues to decrease. For the first time in many months the number of idle cars shows a decrease. The demand for export is strong. Weather conditions uniformly are favorable. Conservative optimism of a healthy type is present throughout the United States, and in all lines of trade, without exception, an improvement has occurred.

**Dun's**—Progress in trade continues, and the improvement, as a whole, is of gratifying proportions, but there is nothing in the commercial situation resembling the remarkable revival of activity on the Stock Exchange. This speculative movement, while having a somewhat stimulating effect upon business sentiment, as perhaps discounting the future, has no counterpart in actual industrial and merchandising conditions as they exist today. The fact is that financial recovery from the effects of the war is much more rapid than in trade, although the advance in the latter is also considerable.

**Bradstreet's**—Passing of the intense pessimism so long ruling, coupled with actual improvement in many lines, is the dominant element in this week's report. Improvement is reflected in brighter skies, better country roads, easier collections, favorable crop news, enlarged distributive trade, increased industrial operations, continued whittling down of idleness and intensive activity in stock market operations.

**Boston News Bureau**—While general trade, outside of the war orders, does not improve so fast as one would like to see, it is believed that the tide is turning and that the pace toward betterment will be quicker as the season advances. General business cannot be confined to a few special lines long. It will broaden naturally. Fundamental conditions are gaining strength all the time. However the situation abroad may shape up in the immediate future, our products will be wanted by Europe for a long time to come, and we are bound to gain foreign credit or gold. All we need to do is to keep strictly to our neutrality to hold our present commanding position.

**American Wool and Cotton Reporter**—The bulk of the business is on foreign wools, but largely owing to the scarcity of the domestic supply. The woolen goods market is awaiting developments. Wool fabrics are now selling for spring and summer wear, whereas they are seldom used except in cold weather. Orders for uniform fabrics have kept the mills busy.

**Iron Age**—The Pennsylvania R.R.'s announcement that it is about to buy or build 16,500 cars and 194 locomotives and the tentative placing in this country of further large sections of the Canadian Car & Foundry Co.'s \$80,000,000 shrapnel contract have been the main contributions of the week to the news of better business. There is also the expectation that the Pennsylvania rail order will soon be distributed, adding 150,000 tons or more to the 20,000 tons already placed.

### ATLANTIC SEABOARD

#### BOSTON

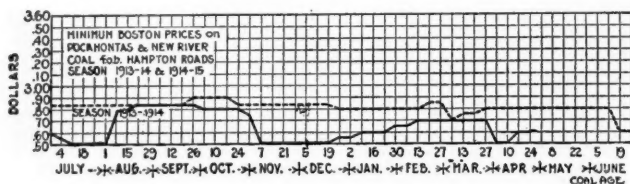
**Better feeling noted with regard to prices on Pocahontas and New River but tonnage outlook not improved. Georges Creek shares in the general dullness. Pennsylvania grades being considered in new directions. Anthracite demand improves.**

**Bituminous**—Pocahontas and New River continue fairly firm, considering the general situation. While there is more or less vacillation as to prices for future delivery, no material concessions have been heard and apparently recent efforts to curtail production have been somewhat effective. There is a noticeably better feeling among the sales agencies with regard to prices although the prospects for any improvement in the near future are as hopeless as ever. There is little doing in the way of closing contracts. Buyers who are still waiting are likely now to defer purchases until June at least. Receipts here are well in excess of the demand and "market cargoes" are going hard. The mills this season are taking coal very conservatively; even those with ample storage are

holding their contractors down to "monthly proportions." Several mill buyers who last year made contracts early are now buying only as needs require and are disposed to follow out that policy for months to come.

To show how New England buyers view the market, the recent action of the City of Boston authorities is a case in point. Bids were received Apr. 7 for supplying 41,000 tons to the harbor institutions, but they were rejected, and the city has now readvertised. There is no great amount of faith here in present prices holding through May and June.

The Georges Creek shippers are pressed with coal at all points, and there seems no improvement in demand. Their barges and steamers are moving on schedule, however, and if at times cargoes here are absorbed slowly, yet consignment is found and without any appreciable effect on the market.



The Pennsylvania coals are mulling along on small tonnages. A number of contracts have lately been closed, and in some few cases where West Virginia coals have usually been preferred in the past. The shippers are correspondingly encouraged over their prospects. All-rail trade is spasmodic, with prices averaging 5@10c. less on quantity orders than prevailed a year ago. One of the largest consumers in Boston is trying out different grades from Pennsylvania in the effort to make comparisons with Pocahontas and New River. Cambrias and Somersets that can show a uniform grade are receiving greater consideration here than usual.

**Water Freights** are unchanged. There are plenty of bottoms offering for what spot business there is and rates are easy at 80c., Hampton Roads to Boston.

**Anthracite**—The demand is noticeably better than early in the month. The weather has helped out the retailers, particularly to the Eastward, and orders that were not expected until later in the season have been coming in rather freely the past week. The prospect is that the shipping companies will carry over business into May that was unlooked for. Some of the shippers have had to disappoint Eastern consignees on the volume of April coal they could send forward.

Current quotations on bituminous at wholesale are about as follows:

	Clearfields	Cambrias Somersets	Georges Creek	Pocahontas New River
Mines.....	\$0.85@1.40	\$1.15@1.60	\$1.67@1.77	
Philadelphia*.....	2.10@2.65	2.40@2.85	2.92@3.02	
New York*.....	2.40@2.95	2.70@3.15	3.22@3.32	
Baltimore*.....			2.85@2.95	
Hampton Roads*.....				\$2.60@2.75
Boston†.....				3.55@3.73
Providence†.....				3.55@3.73

\* F.o.b.

† On cars.

#### NEW YORK

**Domestic grades of anthracite moving freely. Stove coal in strong demand. Bituminous slightly stronger. More contracts closed.**

**Bituminous**—There appears to be a slightly healthier tone than prevailed a week ago and this in spite of the fact that mining has continued on a large scale. There is very little demurrage coal at the terminals, shipments being made to the piers only on orders as they are secured. The coming fall promises better conditions in the bituminous field especially if the international conflict is cleared up. The fear of labor troubles next year is another factor which calls forth the thought that a stimulated market will become physically perceptible within the next few months.

With the loss of the enormous bunkering business of the German lines some little consolation is obtained through the additional tonnage acquired from the increased neutral shipping. The harbor continues busy and these ships require much fuel although the total is far less than the 800,000 to 1,000,000 tons which were formerly taken each year by the great vessels of the German companies.

Some additional contracts have been closed up during the week although there are still some who delay. The figures are practically the same as those which prevailed a year ago. Quotations are: West Virginia steam, \$2.35@2.55; fair grades, Pennsylvania, \$2.55@2.65; good grades of Pennsylvania, \$2.70@2.80; best Miller Pennsylvania, \$3.05@3.10; Georges Creek, \$3.15.

**Anthracite**—There has been a free movement of the various domestic sizes of anthracite during the past week although not the rushing demand which usually prevails in

April. While there are orders for a large tonnage on the books of the retailers, some of this business is being pushed back a little and the dealers, in turn, are not taking the coal so fast as was anticipated a fortnight ago. The line trade keeps active with heavy shipments, and a large tonnage will be accounted for before the warm weather sets in. Now that Lake navigation is open there will soon be an urgent demand for Western shipment. A few minor contracts have been awarded within the past ten days at good prices which aggregate quite a tonnage.

In the local market stove coal is in strong demand. Chestnut is also moving more freely than before, while egg seems to be plentiful and orders are lighter. Pea coal and the smaller steam sizes are probably easier than a week ago owing to the steady continuance of mining and No. 2 buckwheat, which was short in the better grades, may now be loaded promptly. The wholesale trade is in a very satisfactory state, all things considered, and there is no doubt that there will be an increased impetus from now to the end of the month.

The anthracite market is now quotable on the following basis:

	Upper Ports		Lower Ports	
	Circular	Individual	Circular	Individual
Broken.....	\$4.60	\$4.60	\$4.55	\$4.55
Egg.....	4.85	4.85	4.80	4.80
Stove.....	4.85	4.85	4.80	4.80
Chestnut.....	5.10	5.10	5.05	5.05
Pea.....	3.55	3.35@3.55	3.50	3.15@3.50
Buckwheat.....	2.80	2.60@2.80	2.50@2.75	2.35@2.75
Rice.....	2.30	2.30@2.40	2.00@2.25	2.10@2.35
Barley.....	1.80	1.60@1.80	1.75	1.40@1.75

#### PHILADELPHIA

**Market in anthracite shows no diminution in demand for domestic sizes. Steam sizes in easy supply, and output probably in excess of current requirements. No change in bituminous situation.**

**Anthracite**—For the balance of the month the outlook indicates good business on the domestic sizes of anthracite. The demand still centers on egg, and while the requisitions for this size are hardly likely to warrant premium coal, at the same time, it is understood that both the companies and individuals are hard pushed for this particular size. Broken coal has shown a marked improvement the past week. Stove is in about the same condition as egg, although there does not seem to be such a sharp demand. Chestnut is still being absorbed and there is a brisk market for pea, but with production at the maximum, it is doubtful if the trade is taking all of it. Buckwheat and rice are already showing indications of the usual spring slump, occasioned by the closing down of furnaces for heating the large buildings. It is also understood that some of these sizes are going into stock.

Prices at Tidewater rule about as follows:

	Circular	Individuals
Broken.....	\$4.25	\$4.25@4.35
Egg.....	4.50	4.50
Stove.....	4.50	4.50
Chestnut.....	4.75	4.65@4.75

**Bituminous**—The situation in bituminous remains unchanged. Speculation as to the future has ceased, and the operators are concentrating their efforts on securing all the business they can at current prices. The demand is confined to contracts, and but little new business is offering. A revival of commercial activity seems to be slowly materializing, but the effect as yet on the bituminous trade is hardly noticeable. Prices for medium grades are still \$1 to \$1.05 with the better coals offering at 35 to 45c. higher.

#### BALTIMORE

**Trade in the best condition for a long time. Demand improves and prices stiffen. Gas coals remain weak. New anthracite schedule in effect.**

The present week opened with soft-coal trade in the best condition for weeks. There are reports of a better demand on both contract and spot business and contract prices have stiffened from five to ten cents a ton over the cuts on last year's prices as effective for several weeks previous; certain classes of spot coal are also advancing. The bituminous mining regions also report spot prices about five to ten cents better, although there is still no great demand for fuel. Producing interests are convinced that better times are at hand, and are holding more firmly to their product.

West Virginia gas coals have not responded to the upward tendency so far, but it is felt that there will be improvement shortly. Three-quarter gas is still selling around 75 and 80c. at the mines, while low-grade steam coals of West Virginia are bringing 80 to 85c.

Export movement continues heavy by reason of the fact that southern Europe and South America are cut off from the better grades of Welsh coal. The month of April seems likely to establish a new record for foreign movement from this port.



## HAMPTON ROADS

Export shipments moving in large quantities. Prices firm and demand improving.

Large export cargoes have been loaded during the week. The coastwise movement has been principally to the New England ports the largest percentage going to Boston. The largest cargo of the week was taken by the U. S. Naval collier "Neptune" which loaded 10,515 tons of cargo and 1480 tons of bunker coal. The export coal has all been New River and Pocahontas run-of-mine, as usual, but there has been some nut and slack shipments to the New England market. From the number of cargoes going foreign it will be seen that the demand is increasing; while a majority of the ports are regular customers of Hampton Roads coals, others only purchase here when there is difficulty in getting the European product.

Steamers and schooners loading at Hampton Roads with export cargoes, week of Apr. 9 to 16 inclusive were as follows:

Norfolk			Newport News		
Vessel	Tons	Destination	Vessel	Tons	Destination
Batinin Accame	6100	Catania	Frankby	5800	Taranto
Ed. R. Smith	762	Azores	Berwinimoor	7100	Taranto
Lewiston	1123	Maranhao	Stephen	2875	Para
Orkild	3231	Havana	Llanberei	5000	Rio
Tredenskjold	5600	Canal Zone	Competitor	5200	Rio
Camillo May Page	1049	Punta del Gorta	Melbon Smith	950	Rio
Genova	5632	Genoa	Eva B. Douglas	1645	San Juan
Ada	2675	Santiago			
Atlantide	7051	Elba			
Geo. M. Embiricos	5746	Piraeus			
Emily I. White	512	Santo Domingo			
Elvaston	6008	Montevideo			
Breynton	6344	Buenos Aires			
Three Marys	1569	Bermuda			
Josef Frederik	2000	St. Thomas			
Pacific	6946	La Plata			
Doris	4768	Cagliano			
Tottenham	4500	St. Lucia			
Itasca	1033	Bermuda			

Note—Steamers are indicated by bold face type, all others being schooners.

## OCEAN FREIGHTS

Market slightly easier and rates lower.

The freight market is slightly easier than a week ago, owing more to the decreased demand than to the increased supply of tonnage. Although a number of steamers were chartered for export coal during this period, the freight rates were but slightly lower than previous quotations.

To	Rate	To	Rate
Havana.....	\$2.25@2.50	Guantanamo.....	\$3.00@3.25
Cardenas or Sagua.....	2.75@3.00	Demerara.....	5.50@6.00
Cienfuegos.....	2.75@3.00	Bermuda.....	3.50@3.75
Port au Spain, Trinidad.	3.75@4.00	Vera Cruz.....	3.50
St. Lucia.....	3.50@3.75	Tampico.....	3.50
St. Thomas.....	3.25	Rio.....	9.60
Barbados.....	3.75@4.00	Montevideo.....	9.36
Kingston.....	3.00@3.25	Buenos Aires or La Plata	9.36
Curacao.....	3.75@4.00	Mediterranean*.....	10.20@10.80
Santiago.....	3.00@3.25	Valparaiso.....	8.40@9.60

Note—Rates noted in bold face type are only approximate.

\* To a direct port not east of the West coast of Italy, Spain excluded.

† With 800 tons per day discharge.

W. W. Battie & Co.'s Coal Trade Freight Report.

## OCEAN CHARTERS

Coal charters have been reported by the "Journal of Commerce" as follows:

Vessel	Nationality	From	To	Tons	Rate
Paralos	Greek	Baltimore	Buenos Aires	2022	\$9.36
Grigorios Anghelatos	Greek	Baltimore	W. Coast Italy	2339	11.04
Orion	Greek	Baltimore	Naples	2081	10.80
Phineas W. Sprague		Norfolk	Azores	709	
James Rothwell		Philadelphia	Biddeford	473	
Jane Radcliffe	British	Baltimore	River Plate	2642	9.36
Fernfield	British	Baltimore	Leghorn	2025	10.54
Robert H. McCurdy		Baltimore	Puerto Cabello	602	4.00
Bertrand	British	Atlantic R.	River Plate	2282	9.24
Competitor	British	Atlantic R.	River Plate	2216	9.12
Rio Janeiro					9.60
William H. Sumner		Norfolk	Maranhao	489	6.00
Sedgwick		Norfolk	Maranhao		
James William	British	Norfolk	Paramaribo	440	
Ninetta M. Porcella		Norfolk	Bermuda	466	3.25
Bessie Whiting		Philadelphia	Charleston	531	
City of Augusta		Philadelphia	Camden, Me.	514	1.00
Rauma	Norwegian	Baltimore	River Plate	1951	9.36
Cardiff	British	Baltimore	River Plate	1786	
Rosario		Baltimore	River Plate		9.60
Hopemoor	British	Baltimore	Savona	2375	10.80
St. Theodore	British	Baltimore	Genoa	3175	
Anglier	British	Baltimore	Leghorn	2148	
Antonio	British	Baltimore	Marseilles	1663	
Fevordale	British	Baltimore	W. Coast, Italy	2538	
Fratelli Bianchi	Italian	Baltimore	W. Coast, Italy	2237	
Talisman	Norwegian	Baltimore	Havana	1178	
Henry Lippitt		Norfolk	Maranhao	790	\$6.00
Warren Adams		Norfolk	Maranhao	587	
James W. Elwell		Philadelphia	Para	1081	6.00
George D. Edmonds		Baltimore	Cienfuegos	438	
Crescent	Cuban	Philadelphia	Eastport	400	1.50
Mobila	Cuban	Philadelphia	Havana	1363	

## LAKE MARKETS

## PITTSBURGH

Market more demoralized. Free coal at \$1 for mine-run. Lake prospects poor. Mines operating 50%.

The coal market seems to have lost still more ground in the past week, and prices are lower than ever on free coal and possibly also on contract. While surplus production is given as one cause for the demoralized situation as to prices, Pittsburgh district operators are disposed to place most of the blame on other sections, making reference in particular to "wild cat" operations in West Virginia. There is a surplus of free coal in the Pittsburgh district but if there was any absorbing power in competitive markets the quantity would probably not appear large. Production, of course, might then be considerably increased. The Pittsburgh shippers certainly show a disposition to produce all the coal that can possibly be sold without actual loss.

Lake navigation is nominally open but practically there is hardly any coal moving and it does not seem likely there will be much of a movement before July. Manufacturing demand has increased slightly, but the domestic trade is down now to summer proportions and on the whole coal requirements are probably less than six weeks ago. Mines are operating at an average of about 50%, but many are idle or running only two days a week.

We quote contracts nominally on the basis of \$1.15 for mine-run, but it is exceptional to obtain that figure even on contracts running to Apr. 1 next. Three-quarter coal for the Lake trade is now being sold occasionally and the price is only moderately well sustained at \$1.15 to consumers and \$1.10 to dealers. We reduce quotations on free coal, but still leave them at higher levels than have obtained on many recent sales: Slack, 75@80c.; nut and slack, 90@95c.; nut, 95c.@\$1; mine-run, \$1@1.05; ¾-in., \$1.10@1.15; 1¼-in., \$1.20@1.25, per net ton at mine, Pittsburgh district.

## BUFFALO

Industrial improvement is under way to a limited extent. Prices continue low and unsettled. Anthracite trade falling behind last year. Lake shipments delayed by ice.

Bituminous—The bituminous market is not making much headway and prices are unsettled, though no additional weakness has developed. Industrial business seems to be mending slowly, but it is still running substantially below normal. Some large war orders for steel have lately been placed with western New York plants and activity is promised for a number of months to come. Bituminous operators are now making Lake shipments in some instances and these may help strengthen the market, but there is a large quantity of coal offering at lower prices than would seem to afford a fair profit. Slack coal holds about steady.

Anthracite—The companies are not getting as many anthracite orders as at the beginning of the month, and it is predicted that the demand will not continue active as long as usual. Dealers are holding off in many localities and will either contract later in the month or wait until May. A fair proportion of them will take their chances of getting coal as needed after the coal-burning season starts in the fall.

The Lake shipments of anthracite have been held up by an unusually extensive field of ice. It is expected that the first shipments will be made during the present week.

## TOLEDO

Navigation opened at Toledo. Considerable coal in the local yards.

Domestic coal is showing some stiffness in both demand and price. Steam coal is still slow. Generally speaking, however, conditions are about the same. Navigation was formerly opened on last Friday. The first vessel to leave Toledo was the "W. H. Donner," owned by the M. A. Hanna & Co.; it carried 10,000 tons of coal for Milwaukee. The "Agassiz" is now loading with 11,000 tons for the same port. It is reported that the Hocking Valley railroad has about 3000 cars of coal in the Toledo and Walbridge yards and Supt. Palmer states that about 150 cars of coal are being received daily.

## COLUMBUS

Trade quiet in every department. Lake shipping slow in opening and steam business is also quiet.

Little demand is noted in domestic trade as the season is practically over. Dealers' stocks are somewhat larger than usual in some sections, while in other localities they are rather short. The tone of the trade is still good and future prospects appear to be brighter in the face of improved industrial conditions.

Steam business is still slow although something has been



done toward renewing contracts. Quite a few of the steam consumers are expecting rather cheap fuel during the summer and are loath to contract at this time although some have signed up and the outlook is not so bad as formerly. Railroads are taking a considerable tonnage now. Some lines of manufacturing appear to be improving slowly and this means an increased demand for steam grades.

Lake trade shows a little activity. Some few boats will be loaded during the coming week for shipment at the opening of navigation but on the whole operators are holding off until later in the season. The large tonnage carried over on the docks of the Northwest is the principal cause for the slowness in opening. Chartering of vessels is not at all active. Lake prices will probably remain the same as last year.

Production in Ohio fields has been rather small during the week. In the Hocking Valley it is estimated that but 25% of the average has been produced. This is also true of Massillon, Cambridge, Crooksville and Jackson districts. In the Pomeroy Bend field the output has been about 45% of normal. Many mines have been closed entirely in all fields.

Prices in the Ohio fields are:

	Hocking Valley	Pomeroy	Kanawha
Rescreened lump.....	\$1.45	\$1.50	.....
Inch and a quarter.....	1.30	1.35	\$1.30
Three-quarter inch.....	1.25	1.30	1.25
Nut.....	1.15	1.25	1.15
Mine-run.....	1.05	1.10	1.05
Nut, pea and slack.....	0.70	0.75	0.65
Coarse slack.....	0.60	0.65	0.55

#### CLEVELAND

The trade is absorbing a larger tonnage, but the market is slightly lower than a week ago. Consignment coal a depressing feature.

Slack is selling at \$1.65 to \$1.70 on track here as compared with \$1.70 to \$1.75 a week ago. These are Monday prices and are likely to change toward the end of the week. The fine coal on track was mostly Middle district and Pennsylvania grades brought in over the Pan Handle. There was also some West Virginia No. 8 and Fairmont nut on track Monday, which sold for \$1.80 to \$1.85. Spot three-quarter coal brought \$1.80 to \$1.90. The lower price was paid for West Virginia No. 8 and the higher for Bergholz and high grade Middle district coals. Mine-run sold at \$1.80 and a little 1½-in. lump sold for \$1.95 to \$2. A good deal of coal was carried over Monday night.

Business is much better than at the opening of the year when the improvement started. There has been no let up in the increased business and while it is not up to what would be termed normal for a good year, it is becoming more general and is no longer confined to a few large companies.

**Lake Trade**—The Lake business does not show much life. The boats that are downbound will be on the market for coal the last of the current week or early next week and a number of them will have trouble getting coal cargoes. C. Reiss Coal Co. officials were in the city the week of Apr. 11 and arranged for the floating of 2,500,000 tons of coal to Sheboygan, Wis., Green Bay, Wis., Escanaba, Mich., and Duluth, Minn. The rate will be 30c., the same as last year. Most of the business is done on long-term contracts.

The outlook for Lake coal is better. Iron ore selling had not started last Monday, but the United States Steel Corporation is preparing to ship a large tonnage of ore, and the independent inquiry for ore is growing. Optimism is quite general.

Quotations on coal for shipment are:

	Pocahontas	Youghiogheny	Bergholz	Fairmont	W. Va. No. 8
Lump.....	\$3.10				
Lump, 1 in.....		2.20@2.25	2.00	\$1.90@1.95	\$1.90@2.00
Egg.....	3.10				
Mine run.....	2.65@2.70	2.10	1.90	1.85@1.90	1.75@1.90
Slack.....		1.70@1.75	1.70@1.75	1.75@1.80	

#### CINCINNATI

Improving industrial conditions have strengthened the nut and slack market. Beginning of the Lake movement has encouraged domestic production slightly.

While there has been no tangible change in the local situation during the past week, there is undoubtedly an improved feeling among manufacturers, as is evidenced by the continued strength of the screenings market. It is probable that the general industrial situation in this vicinity is better than for many months, making the prospects very good for summer business on the steam side of the market. If it develops that there is a normal market for the prepared grades the trade will have a first-class season. There is still some uncertainty on this score, however, as it seems to be extremely difficult to get accurate figures on the amount of domestic coal left over, either in this immediate section or at the Lake ports.

## COKE

#### CONNELLVILLE

Undertone continues to strengthen, with slightly more activity. Production and shipments make new record for this movement.

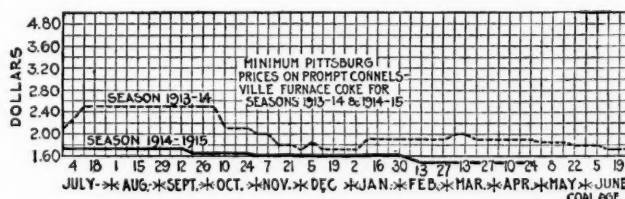
While there is not much activity, there is slightly more inquiry, and the whole tone of the coke market continues to strengthen in greater ratio than would be indicated by the new demand. Coke operators evidently have their eye on the steel trade, observing possibilities of further improvement and greater absorption of coke, even if it is only coke produced by the consumers. Such increased operations mean greater employment of labor, and there is not enough labor in the region, and probably not enough obtainable, to operate the district at capacity. It is said that a couple more merchant furnaces coming into the market and absorbing merchant coke would start prices definitely on the upgrade, and \$3 coke is regarded as by no means an impossibility within a few months.

Prompt furnace coke continues to show a firm tone, and well above \$1.55 has been paid for good brands. There is a little tentative inquiry for furnace. We quote: Prompt furnace, \$1.55@1.60; contract furnace, to July 1, \$1.60@1.65; contract furnace, Jan. 1, \$1.75; prompt foundry, \$2@2.35; contract foundry, \$2.20@2.30, per net ton at ovens.

The "Courier" reports production in the Connellsville and lower Connellsville region in the week ended Apr. 10 at 292,215 tons, an increase of 10,964 tons, and shipments at 287,829 tons, an increase of 9815 tons. Both production and shipments made new records on this movement.

**Buffalo, N. Y.**—The market shows little activity and prices remain about the same as for some weeks. Dealers report a notable hesitancy among consumers to enter into contracts. Prices remain unchanged at \$4.25 for the best 72-hr. Connellsville foundry and \$3.30 for stock coke.

**Chicago**—The coke market is fairly steady but it is reported that some consignment shipments have been sold this week at a sacrifice. There is an improved demand for furnace and foundry coke, but so far the domestic sizes have not shown the liveliness anticipated. Quotations are as follows: Byproduct, \$4.45@4.65; Connellsville, \$4.50@4.75; Wise County 72-hr. (select), \$4.50; gas coke, \$3.75@4; furnace, \$4.45@4.65.



## SOUTHERN

#### LOUISVILLE

Dealers coming into the market. Large shipment of river coal started from Pittsburgh.

Retail dealers are showing considerable disposition to begin stocking for next season's trade. Straight mine-run is now selling around \$1, due in part to the fact that there is little movement of the block coals. Six-inch mine-run is on much the same basis. Block coals are offered at from \$1.40 to \$1.55, round at from \$1.15 to \$1.25 and nut and slack of the better grades, is up to 65 and 85c., due to the fact that it is scarce. All prices are f.o.b. mines.

Dispatch in this direction of fourteen barges of coal from Pittsburgh has been announced, the first shipment of the kind in many weeks, due to the low river stages. There is a very large quantity of coal in the Pittsburgh pools, according to reports here.

#### BIRMINGHAM

Steam fuels slightly improved. Lump coal very quiet.

The market on steam coal shows some improvement over last week, the demand being slightly stronger for the better grades, though conditions are far from normal, mines running only about two or three days per week. Lump coal shows no improvement, the demand being very light, and operators are making only what tonnage they are actually shipping. Prices are at least 50c. per ton lower than usual on lump coal.

## MIDDLE WESTERN

### CHICAGO

Light demand for Indiana coals though prices are well sustained. Franklin and Williamson County operators holding together firmly. Anthracite movement light.

The demand for steam coal from the Indiana mines is of little consequence, and it is reported less is moving at this time than a year ago. On the whole, Indiana operators are maintaining prices satisfactorily, even though the demand is light. No. 4 lump has sold at \$1.35 and domestic sizes at around \$1.40, with few shipments of the latter. Screenings show the same strength as last week.

Movement of coal from the Springfield district is quiet, but more contracting is being done by the operators there than elsewhere, particularly with the railroads. Contracts awarded so far are reported to be at the same figure as last year.

In Franklin and Williamson Counties the mines are averaging about three days per week. Coarse coals are in little demand but the Operators Association is maintaining stable prices.

Hockings are in the doldrums, and there is no business to be reported. The operators show no disposition to ship any free coal into this territory.

In smokeless coals there is little buying by retailers, but prices for direct shipment from the mines seem to be better maintained than heretofore. No free coal is reported on the market.

Anthracite trade is quiet and the movement so far well below last year. It is felt that the closing week of April will see a rush of orders to take final advantage of April storage prices.

Prevailing quotations are as follows:

	Williamson and Franklin Cos.	Springfield	Sullivan	Clinton	Carterville
Lump.....	\$1.25@1.35	\$1.35	\$1.35@1.50	\$1.30@1.50	\$1.35@1.50
4-in. lump.....			1.35@1.45		
Steam lump.....			1.25@1.35	1.20@1.30	
24-in. lump.....	1.20@1.30	1.20@1.30	1.25@1.35		
14-in. lump.....	1.25	1.25	1.25@1.40		
Mine-run.....	1.10	1.00@1.05	1.00@1.20	1.00@1.10	
Egg.....	1.25@1.35	1.30@1.35	1.30@1.45	1.20@1.30	
No. 1 washed.....	1.25		1.65		1.35@1.50
No. 2 washed.....	1.25		1.75		1.35@1.50
6x3-in. egg.....					1.50
Nut.....		1.15@1.25	1.25@1.40	1.15@1.20	
No. 1 nut.....	1.25@1.35				
No. 2 nut.....	1.25@1.35				
Screenings.....	0.85@0.90	0.80	0.80@0.95	0.75@0.80	0.90

	Saline Co.	E. Kentucky	N. Riv. & Poca.	Somerset	Hocking
Lump.....	\$1.25@1.35	\$1.30@1.40	\$1.50@1.60	\$1.50@1.60	\$1.40@1.60
4-in. lump.....	1.15@1.25	1.25@1.35			
Mine-run.....	1.00@1.10		1.15@1.25	1.15@1.25	1.25
Egg.....	1.20@1.35	1.00@1.10	1.50@1.60	1.50@1.60	
Nut.....			1.30@1.40		
Screenings.....	0.75@0.85				

Knox and Greene County 5-in. lump, \$1.25@1.35; 3-in. lump, \$1.10@1.15; 5-in. egg, \$1.10@1.15; 3-in. egg, \$1.10@1.15; mine-run, \$1@1.05. Screenings 80 to 90c.

### ST. LOUIS

Domestic movement practically ceased and steam demand also flat. Outlook generally unfavorable.

There is very little activity in the local markets, with the possible exception that there is an effort to get better prices when there is no market. It is remarkable that with practically no domestic coal moving, there is not the demand for steam coal that had been anticipated. The result is that the market is in bad shape.

There is a little tonnage of Carterville and Franklin County coal moving into the country, but very little locally. The Standard market is at a standstill, excepting for the movement of railroad coal. A small tonnage of anthracite is moving in, but other than that there is very little doing.

Conditions are not at all favorable for even the average volume of business at this time of the year. Effective Apr. 12, a new scale of prices from the Standard fields went into effect, but the result will not be known until the surplus tonnage on hand has been consumed.

### KANSAS CITY

Retail business about over for the season and wholesale very quiet.

The retail business here has come to a close and the wholesale trade continues without any change and with very little movement. Prices remain the same and show no indication of a change. Very little coal is being taken from the mines in Missouri and Kansas and thousands of miners are out of employment.

## PRODUCTION AND TRANSPORTATION STATISTICS

### IMPORTS AND EXPORTS

The following is a comparative statement of imports and exports of the United States for February, 1914-15, and for the eight months ending February, 1913-14-15, in long tons:

	Eight Months		February	
	1913	1914	1914	1915
Imports from:				
United Kingdom.....	7,355	8,460	27,270	3,547
Canada.....	954,363	654,641	742,500	75,570
Japan.....	42,217	81,476	64,201	7,170
Australia and Tasmania.....	107,017	172,127	124,131	30,843
Other countries.....	3,257	2,010	1,447	43
Total.....	1,114,209	918,714	959,549	117,173
Exports:				
Anthracite.....				
Canada.....	3,170,607	2,445,231	2,286,289	203,130
Brazil.....			6	
Uruguay.....		84		
Other countries.....	53,997	45,360	39,821	3,683
Total.....	3,224,604	2,490,675	2,326,116	206,813
Bituminous.....				
Canada.....	7,559,065	8,956,986	6,307,734	440,712
Panama.....	307,759	257,704	170,797	16,650
Mexico.....	206,908	205,144	271,054	22,171
Cuba.....	805,162	787,134	670,974	101,375
West Indies.....	402,705	380,457	277,397	43,156
Argentina.....		76,410	184,393	23,609
Brazil.....		185,687	230,188	15,166
Uruguay.....		22,039	30,494	5,181
Other countries.....	642,367	773,377	1,126,755	98,259
Total.....	9,923,966	11,644,938	9,269,786	766,309
Bunker coal.....	4,794,942	5,110,588	4,452,363	335,529
				502,449

### NORFOLK & WESTERN

Destination of shipments over this road for March of this year, the three months of this year and last year were as follows, in short tons:

	March		Three Months	
	1914	1915	1914	1915
Coal.....				
Tidewater, foreign.....	158,247	190,818	428,672	387,443
Tidewater, coastwise.....	342,530	310,353	991,863	835,922
Domestic.....	1,611,341	1,403,581	4,323,872	4,189,346
Coke.....				
Tidewater, foreign.....		327	15	1,837
Domestic.....	103,070	70,797	317,669	208,087
Total.....	2,215,188	1,975,876	6,062,091	5,622,635

## FOREIGN MARKETS

### GREAT BRITAIN

Domestic coals easier, but steam fuels still short. Prices continue to advance. Wage question more acute.

Apr. 9.—Business in the coal trade has been under the influence of the holidays during the greater part of the week, and although the miners as a rule loyally responded to the call of the Government to return to work as early as possible, the suspension of operations has naturally resulted in some further temporary restriction of the output and the supply available. There are no important changes in the position to note, however, the outstanding features being an easier tone in the house coal market and a very strong demand for practically every other class of fuel, accompanied by prices which show no sign of declining.—"The Iron and Coal Trade Review."

Apr. 9.—There is great pressure for all descriptions, and coals are exceedingly scarce for this month's shipment. Quotations are approximately as follows:

Best Welsh steam.....	Nominal	Best Monmouthshires.....	\$8.28@8.40
Best seconds.....	Nominal	Seconds.....	7.80@8.04
Seconds.....	\$8.88@9.12	Best Cardiff smalls.....	5.16@5.28
Best dry coals.....	8.88@9.12	Cargo smalls.....	4.32@4.56

The prices for Cardiff coals are f.o.b. Cardiff, Penarth or Barry, while those for Monmouthshire descriptions are f.o.b. Newport, both net, exclusive of wharfage.

Freights—Outward chartering is very quiet owing to the continued stemming difficulties. Tonnage does not offer freely. Rates are rather unstable but are approximately as follows:

Gibraltar.....	\$3.84	Naples.....	\$4.80	Las Palmas.....	\$3.60
Marseilles.....	5.02	Venice.....	9.60	St. Vincent.....	4.32
Algiers.....	3.86	Alexandria.....	6.60	Rio Janeiro.....	6.72
Genoa.....	4.80	Port Said.....	6.48	Monte Video.....	5.88
				River Plate.....	6.12

Note—These quotations are based on an exchange rate of 24c. to one shilling.



## Coal Contracts Pending

*The purpose of this department is to diffuse accurate information of prospective purchases and prices with a view to affording equal opportunity to all, promoting market stability and inculcating sound business principles in the coal trade.*

For the official advertisements of bids wanted see the **Contracts-to-Be-Let** section on page 12.

†Indicates contracts regarding which official information has been received.

### Recast

This section gives a synopsis of items previously announced that will come up for consideration during the ensuing week, together with the number of the page on which the former notice appeared; also additional or supplemental information, such as bids, etc., on other old contracts.

†No. 312—Chicago, Ill.—The City of Chicago is readvertising for bids on a portion of this contract (pp. 488, 666) for coal as follows: 1800 tons of screenings per month for delivery on cars at the 39th St. Pumping Station, 400 tons of screenings per month to be delivered in bins at the Lawrence Ave. Pumping Station. Bids must be accompanied by a certified check for \$600 on the 39th St. business and for \$200 on the Lawrence Ave. business. Bids will be received until noon, Apr. 29. Address Clk. John McGillen, Room 700, Karpen Bldg., 910 South Michigan Ave., Chicago, Ill.

No. 396—National Soldiers' Home, Virginia.—The bids on this contract (p. 567) were opened on Apr. 16, but were so close and have required such extensive calculations of analysis, etc., that the name of the successful bidder has not yet been given out. Address Treas. S. E. Skinner, National Soldiers' Home, Virginia.

†No. 437—Boston, Mass.—The bids on this contract (p. 627), which provides for furnishing 2000 tons of anthracite and 1300 tons of bituminous coal to the local Post Office and Sub-Treasury Building, were: Anthracite screenings, Coleman Bros., \$3.30; Wellington-Wild Coal Co., \$3.36; Metropolitan Coal Co., \$3.60; bituminous mine-run, Metropolitan Coal Co., \$4.42; Staples Coal Co., \$4.44. All quotations are per gross ton. Address Custodian William F. Murray, United States Post Office and Sub-Treasury, Boston, Mass.

†No. 454—Cleveland, Ohio.—We are informed that this contract (p. 627), which provides for furnishing the Municipal Electric Light Department with 35,000 to 40,000 tons of Youghiogheny coal, was made for 18 months. Address Supt. of Service and Distribution C. G. Beckwith, Municipal Electric Light Department, Cleveland, Ohio.

No. 461—Boston, Mass.—The City of Boston has readvertised for bids on this contract (p. 627), which provides for furnishing 41,300 tons of bituminous coal to the institutions in Boston Harbor. All stipulations, specifications, etc., apply as previously announced with the exception that bids will be opened on Apr. 27. Address Supt. of Supplies D. Frank Doherty, Room 808, City Hall Annex, Boston, Mass.

†No. 489—Staples, Minn.—One bid has been submitted on this contract (p. 665) by the Dover Lumber Co., which offers to furnish Youghiogheny screenings at \$2.65 per ton. Bids will be received until May 3. Address Supt. John Effinger, Municipal Electric Light Plant, Staples, Minn.

†No. 496—Malden, Mass.—In addition to the previous requirements noted on this contract (pp. 665, 707) we are advised that 700 tons of bituminous coal will also be required for delivery at the High School in the same manner as the anthracite. Address Clk. of Com. John L. Gilman, City Hall Bldg., Malden, Mass.

†No. 505—Louisville, Ky.—This contract (p. 665), which provides for the fuel requirements of the Finzer Tobacco Co., should read 225 tons of nut and slack coal per month instead of per year, as previously noted. Address Purchasing Agent, Finzer Tobacco Co., 4019 Finzer Ave., Louisville, Ky.

No. 506—Chicago, Ill.—We are informed that the tonnage involved in this contract amounts to 10,000 tons instead of 20,000 tons, as previously noted (p. 665). The purchaser has in the past been using southern Illinois screenings on this business. Address Purchasing Agent, Barrett Mfg. Co., 10 South La Salle St., Chicago, Ill.

No. 510—Chicago, Ill.—This contract (p. 665), which provides for furnishing approximately two cars per day to Darling & Co. at this place, has always been filled with southern Illinois 1½-in. screenings in the past. Address Purchasing Agent, Darling & Co., 4201 South Ashland Ave., Chicago, Ill.

†No. 511—Dayton, Ohio.—Bids on this contract (p. 665), which provides for furnishing the National Military Home with coal during the next year, will not be opened until June 30 instead of May 1, as previously announced. Address Treas. W. H. Ortt, National Military Home, Dayton, Ohio.

No. 512—Chicago, Ill.—This contract (p. 666), which provides for furnishing approximately one car of Illinois screenings per day to the Barber Asphalt Paving Co., will come up for consideration shortly. Address Purchasing Agent, Barber Asphalt Paving Co., 7 South Dearborn St., Chicago, Ill.

No. 518—Chicago, Ill.—This contract (p. 666), which provides for furnishing approximately 30 cars of coal to the Bowman Dairy Co., is usually filled with 1½-in. southern Illinois screenings. Address Purchasing Agent, Bowman Dairy Co., 158 West Ontario St., Chicago, Ill.

†No. 522—Lorain, Ohio.—The Board of Education has decided to readvertise for bids on this contract (p. 666), which provides for furnishing coal for the school year 1915-16. The new bids will be solicited on a heat-unit basis, and will be opened on May 12. Address Clk. E. Bruell, Board of Education, Lorain, Ohio.

†No. 527—San Francisco, Calif.—Bids on this contract (pp. 666, 708), which provides for furnishing coal to 28 Western army posts, will be received until 11 a.m., Apr. 30. Address H. S. Wallace, care Quartermaster Corps, "Chronicle" Bldg., San Francisco, Calif.

†No. 531—Frankfort, Conn.—Awards on this contract, which involves about 19,000 tons of coal for the State Prison Department, were scheduled to come up for action on Apr. 26. Address State Prison Commission, Frankfort, Ky.

†No. 540—Knoxville, Tenn.—Bids will be received on or before Apr. 24 for furnishing the Southern Ry. Co. with a large quantity of Alabama mine-run coal (p. 708). Address Fuel Agt. E. G. Goodwin, Southern Ry. Co., Knoxville, Tenn.

†No. 546—St. Joseph County, Ind.—The Board of Commissioners will receive sealed proposals until Apr. 26 for 600 tons of Pocahontas or New River smokeless coal, mine-run, 60% to be lump coal, to be delivered at the county jail (p. 708). Address Auditor Clarence Sedgwick, South Bend, Ind.

†No. 557—Brockton, Mass.—The quantities on this contract (p. 709) have been announced, and are as follows in gross tons: 528 tons of Lehigh egg, 600 tons of Lehigh stove, 1800 tons of Lehigh broken, 300 tons of Shamokin stove, 4700 tons of bituminous steam coal. Bids were received until 3 p.m., Apr. 20, and were submitted on a f.o.b. basis at specified yards at Brockton and Halifax, Mass. Address Highway Commission, City Hall, Brockton, Mass.

†No. 564—New Orleans, La.—Sealed proposals will be received for furnishing the United States Plant at South Pass La., for its annual requirement of coal, until 11 a.m., May 3 (p. 708). Address Maj. Edward H. Schultz, Corps of Engineers, United States Engineer Office, Room 325, Custom House, New Orleans, La.

†No. 567—Brookline, Mass.—Sealed proposals will be received by the local city government until 3:50 p.m., Apr. 26, for furnishing approximately 2963 tons of anthracite coal and 2000 tons of bituminous (p. 709). Address Secy. of Board Edward A. McEttrick, Town Hall, Brookline, Mass.

†No. 568—Albany, N. Y.—Bids on this contract (p. 709), which provides for furnishing about 10,000 tons of anthracite and 3000 tons of bituminous coal for use at the Capitol Buildings were as follows:

Bidder	Anthra. <sup>1</sup>	Slack <sup>2</sup>	Grate <sup>3</sup>	Stove <sup>4</sup>
Willard M. Phillips.....	\$3.68	\$3.75	\$5.54	\$6.12
J. T. D. Blackburn.....	2.97	3.00	5.34	5.80
C. M. Stuart Coal Co.....	2.97	3.12	5.00	5.75
R. B. Rock.....	3.20	3.40	5.00	5.75
E. W. Howell Co.....	2.97	3.04	4.98	5.78
Montgomery Coal Co.....	2.95	2.97	4.90	5.50
W. G. Morton.....	...	...	5.09	5.54

<sup>1</sup>10,000 tons No. 1 buckwheat. <sup>2</sup>2500 tons. <sup>3</sup>600 tons. <sup>4</sup>50 tons of stove or chestnut.

Address Supt. William H. Storrs, Capitol Bldg., Albany, N. Y.



## New Business

**No. 569—Louisville, Ky.**—The Grocers Ice & Cold Storage Co., which consumes an average of 10 to 12 cars of nut and slack during the summer months, has no contract at present but would consider applications for furnishing coal on contract. Address Purchasing Agent, Grocers Ice & Cold Storage Co., 603 East Main St., Louisville, Ky.

**No. 570—Louisville, Ky.**—The American Elevator & Machine Co., which consumes about 300 tons of coal annually, is testing various grades to find one best suited to their purposes. Mine-run and nut and slack are being consumed at present. Address Pres. M. Poschinger, 520 East Main St., Louisville, Ky.

**No. 571—Louisville, Ky.**—The American Baking Co., one of the largest local consumers of coal, will arrange for a supply, probably a year's contract, some time next month. Pres. Budge, American Baking Co., South Tenth St., Louisville Ky.

**†No. 572—New York, N. Y.**—The United States Army will receive bids until 10 a.m., May 12, for furnishing approximately 5200 tons of bituminous and 900 tons of broken egg, stove and nut coal mixed, for deliveries at various points in New York and adjoining stations. Complete details can be had on application. Address Col. A. L. Smith, Depot Quartermaster, Army Building, Whitehall St., New York City.

**†No. 573—Kokomo, Ind.**—The local Board of Education will receive bids until 4 p.m., May 4, for furnishing approximately 800 tons of coal to the local school building during the ensuing year. Bidders are requested to submit quotations on both 2- and 3-in. screenings, Hocking Valley, Indiana No. 4, Virginia Splint and Pocahontas coal. The bids must all be accompanied by satisfactory bonds, and should cover cost of delivery to the various buildings. Address Secy. A. B. Armstrong, Board of School Trustees, Kokomo, Ind.

**†No. 574—Cincinnati, Ohio**—The Board of Education at this place will receive sealed proposals until noon, May 10, for supplying the various public schools with coal approximately as follows: 8000 tons of smokeless mine-run, 1600 tons of nut and slack coal, 2500 tons of lump, 50 tons of Piedmont smithing. All bids must be accompanied by a bond for 30% of the amount of the bid. Specifications are on file at the office of the chief engineer of the Board at 511 West Court St., Cincinnati. Address Business Mgr. C. W. Handman, Board of Education, Cincinnati, Ohio.

**†No. 575—Middletown, Conn.**—Sealed proposals will be received by the Connecticut Hospital for the Insane until 10 a.m., Apr. 26, for furnishing about 8000 tons of bituminous coal and 700 tons of anthracite. Complete details as to point of delivery, quality, etc., can be obtained on application. Address Asst. Supt. Dr. William E. Fisher, Connecticut Hospital for the Insane, Middletown, Conn.

**No. 576—Chicago, Ill.**—The Royal Enameling & Manufacturing Co. is in the market for mine-run coal under a contract to meet its steam requirements, involving about 7000 tons per annum. It has been consuming Knox County, Indiana, coal in the past. Address Pres. J. H. Fall, Jr., Royal Enameling & Manufacturing Co., 326 West Madison St., Chicago, Ill.

**No. 577—Davenport, Iowa**—The Davenport Water Co. expects to make a contract very shortly for its annual supply of coal; about 2000 tons of southern Illinois screenings are required. Address Davenport Water Co., Davenport, Iowa.

**No. 578—Davenport, Iowa**—The Independent Baking Co., which is just starting a new plant here, has not yet let any contract for its coal requirements. It has been using Harrisburg screenings and Harrisburg No. 1 nut for producer purposes. Address Secy. W. H. Wiese, Independent Baking Co., Davenport, Iowa.

**No. 579—Mishawaka, Ind.**—The Dodge Manufacturing Co. will be in the market about June 1 for its annual fuel requirements, aggregating about 9000 tons of mine-run coal. It has been using a West Virginia grade. Address Pur. Agt. F. P. Howlett, Dodge Manufacturing Co., Mishawaka, Ind.

**No. 580—Union, N. J.**—The local Board of Education will receive bids until 8 p.m., Apr. 28, for 100 tons of pea, 200 tons of nut and 300 tons of stove coal. Bidders should quote prices per net ton of 2000 lb. including cost of delivery and storage. Address Secy. Fred Cortal, Board of Education, Union, N. J.

**†No. 581—York, Penn.**—The School Board will receive bids until noon, Apr. 26, for furnishing approximately 1000 tons of anthracite and 1500 tons of bituminous coal to the local schools. Stove, egg, chestnut and buckwheat anthracite will be required, and Greensburg, Yatesboro and Scootac screened lump, Punxsutawney No. 3 screened and Dilltown smokeless mine-run bituminous coal also. Prices quoted should include

cost of delivery to the various buildings. Address Secy. A. J. Updegraff, 229 West Third St., York, Penn.

**†No. 582—Allentown, Penn.**—Sealed proposals will be received by the city government until 9:30 a.m., Apr. 27, for furnishing coal as follows: City Garbage Crematory, 240 gross tons of mine-run gas coal; City Fire Engine Houses, 217 gross tons stove coal, 20 gross tons of chestnut and 20 tons of pea coal; Central Fire and Police Station, 30 gross tons of stove and the same of egg coal. All bids must be accompanied by certified checks and further information may be obtained by addressing the superintendent of the various departments noted. The bids will be received by Mayor Charles W. Rinn, 39 North Seventh St., Allentown, Penn.

**†No. 583—Andover, Mass.**—The local Board of Education is in the market for its annual requirements of coal and will receive bids until Apr. 30, 1915. Complete details can be had on application. Address Superintendent of Public Schools, Andover, Mass.

**†No. 584—Ann Arbor, Mich.**—The Purchasing Committee for the county at this place received bids until Apr. 22 for furnishing 125 tons of Lehigh Valley or Scranton anthracite grate, 75 tons of Lehigh Valley egg and 20 tons of the same, deliveries to be completed before Jan. 1, 1916. Address County Clk. George W. Beckwith, Ann Arbor, Mich.

**†No. 585—Washington, D. C.**—The United States Government will receive bids through the General Supply Committee until 2 p.m., May 6, for furnishing coal to the Executive Department and independent Government establishments in Washington during the fiscal year beginning July 1, as follows: BITUMINOUS (mine-run)—13,000 tons for the Bureau of Engraving and Printing, 2000 tons for the Treasury Building, 3200 tons for the Freedmen's Hospital, 7000 tons for the General Land Office, 20,000 tons for the Hospital for Insane, 5000 tons for the Agricultural Building, 3500 tons (2-in. bar screen; crushed, nut and slack) for the New Museum Building, 7300 tons for the United States Soldiers' Home, 2200 tons for the State, War and Navy Department Building, 7500 tons (crushed, nut and slack) for the Government Printing Office, approximately 4100 tons for delivery at various points in amounts not exceeding 700 tons. ANTHRACITE—3000 tons of buckwheat No. 1 for the Bureau of Standards, 2400 of the same for the State, War and Navy Department Building, 7500 tons of pea for the Government Printing Office, 6000 tons of pea for the Post Office Building, approximately 1600 tons for miscellaneous deliveries; 9010 tons of egg, stove, nut and furnace coal for delivery in small lots to the various buildings of the following departments: Treasury Department, War Department, Department of Justice, Navy Department, Department of Interior, Department of Agriculture, Department of Commerce, Office Public Buildings and Grounds, miscellaneous. Address Acting Secy. of the Treasury Byron R. Newton, General Supply Committee, Washington, D. C.

**†No. 586—Utica, N. Y.**—The Board of Contract and Supply at this place opened bids on Apr. 2 for coal to supply the Department of Public Works, Public Safety and the Department of Charity and the Parks, the bidders being the Utica Coal Co., Sang & Reussig, Emil George, Clark-Davis Co. and Henry F. Miller. Address Clerk of the Board of Contract and Supply, City Hall, Utica, N. Y.

**†No. 587—Cohoes, N. Y.**—The Board of Education at this place will contract in May or June for its annual requirements of coal, aggregating about 400 tons. Egg coal is used mostly, but some stove is also required. The cost for the coal on the expiring contract was about \$6.25 per ton. The call for bids is advertised and the business let on a competitive basis. Address Board of Education, City Hall, Cohoes, N. Y.

**†No. 588—Everett, Mass.**—The Board of Education at this place will be in the market some time during May or June for its annual requirements of coal, aggregating 1800 to 2000 tons. The ash content must not exceed 14% and the price per ton in 1914 was \$6.24. The call for bids is advertised. Address Committee on Fuel Supply, Board of Education, Everett, Mass.

**†No. 589—West Hoboken, N. J.**—The Board of Education of this place will receive bids until 8:30 p.m., May 27, for supplying the various schools with 1000 tons of stove and egg coal. Address Secy. Alexis Benoist, Board of Education, Hoboken, N. J.

**†No. 590—Philadelphia, Penn.**—Sealed proposals will be received until 1 p.m., May 18, for furnishing the Frankford Arsenal with coal as follows: 11,000 gross tons of best grade Clearfield, Berwind-White Scalp Level or other coal of equal value, deliveries to be at the rate of 300 tons per week during the winter and 200 tons per week during the summer; 90 tons of the best Lehigh stove coal; 100 tons of Connellsville coke, stove size. Bids will be received only from responsible dealers and quotations should be made delivered

f.o.b. Frankford Arsenal, except on anthracite coal, which is to be delivered in bins on the arsenal grounds where required. Payment will be made on the price quoted with correction for variations in the heating value and ash. Complete details and specifications can be had on application. Address Commanding Officer, Frankford Arsenal, Philadelphia, Penn.

†No. 591—Troy, Ohio—The Public Service of this city will receive bids until noon, Apr. 27, for furnishing coal to the Water Works, Electric Plant and City Hall for the fiscal year beginning May 1, 1915. Mine-run coal and different grades of nut and slack are required, and bids should include cost of delivery in bins as required, but the cost of hauling from railroad cars should be quoted separately. All bids must be accompanied by a certified check for \$100, and the successful bidder will be required to furnish a bond for \$2000. Address Dir. of Pub. Service Henry J. Beck, City Hall, Troy, Ohio.

†No. 592—Nashville, Tenn.—The local Board of Education will be in the market during May or June for its annual requirements of coal, amounting to about 40,000 bu. of lump and 20,000 to 40,000 bu. of pea and slack. The current contract is being filled with Kentucky vein No. 9 coal at \$2.10 per ton for lump and \$1.60 per ton for pea and slack. The call for bids is advertised. Address Board of Education, Nashville, Tenn.

†No. 593—Boston, Mass.—The Supply Department of the City Government will receive bids until Apr. 29 for furnishing coal to the public buildings as follows: 7400 tons of broken, 7200 tons of egg, 3620 tons of stove, 900 tons of screenings and 9150 tons of bituminous. Bids will also be received at the same time for 350 tons of stove for delivery at Long Island, 150 tons of egg and stove each at Deer Island, 50 tons of stove and 150 tons of egg at Rainsford Island. Address Supt. D. Frank Doherty, 808 City Hall Annex, Boston, Mass.

No. 594—Mattoon, Ill.—The Central Illinois Public Service Co., whose general offices are at this place, is in the market for a contract covering its requirements, aggregating about 4000 tons, for delivery at about 20 different plants in Illinois; 1½-in. and 3-in. screenings and mine-run coal are required. Address Pur. Agt. D. R. Truax, Central Illinois Public Service Co., Mattoon, Ill.

†No. 595—Hartford, Conn.—Bids were received until noon, Apr. 13, for furnishing the State Capitol with coal as follows: 700 tons of Lehigh egg (of not less than 12,000 B.t.u.) and 600 tons of Lehigh pea (of not less than 12,300 B.t.u.). Address Comptroller Morris C. Webster, State Capitol, Hartford, Conn.

## Contracts Awarded

Note—Successful bidders are noted in bold face type.

No. 221—Columbus, Ohio—This contract (p. 446), which provides for furnishing the local Post Office with 700 tons of bituminous coal, has been awarded to the **Taylor-Williams Coal Co.** The contract provides for West Virginia mine-run coal at \$2.24 per gross ton. Address Custodian S. A. Kinnear, United States Post Office, Columbus, Ohio.

†No. 262—St. Louis, Mo.—This contract (pp. 447, 664), which provides for furnishing and delivering 360 tons of bituminous coal to the Federal Building has been awarded to the **Boehmer Coal Co.**, at \$2.36 per ton for 2-in. lump coal. Address Custodian Fountain Lorthwell, Federal Bldg., St. Louis, Mo.

†No. 290—East Orange, N. J.—This contract (p. 487) which provides for furnishing the local Board of Education with about 1800 gross tons of anthracite coal has been awarded as follows: **East Orange Coal & Supply Co.**, 1500 tons for delivery April to June; **David W. Ball Co.**, 300 tons for deliveries after August. Address Secy. Warren A. Clapp, Board of Education, East Orange, N. J.

†No. 340—Rochester, N. Y.—Awards on this contract (p. 528), which provides for furnishing the fuel requirements at the local public schools, were:

**F. P. Weaver Coal Co.**—Spring deliveries, anthracite egg and stove, \$5.44; nut, \$5.67. Winter deliveries, anthracite egg and stove, \$5.82; nut, \$6.05.

**Jenkins & Macy Co.**—Morris mine-run, \$3.10; Morris lump, \$3.30; Eureka Scalp Level, \$3.40; semianthracite screenings, \$2.35.

**Yates Coal Co.**—Indiana County, \$3.10; Cambria County, \$3.25; bituminous nut slack, \$2.85.

**D. M. Filkins & Son**—Three-quarter lump, \$3.25; anthracite buckwheat, July 1 to Oct. 1, \$3.20; same, Oct. 1 to end of contract, \$3.30.

Address Secy. J. S. Mullan, Board of Education, Municipal Bldg., Rochester, N. Y.

†No. 345—Salem, Ohio—This contract (p. 528), which provides for supplying coal to the local city water-works, has been awarded to **Reece Bros.** at \$1.85 per ton of mine-run, delivered. The next lowest bidder was the **Keystone Coal Co.**, of Cleveland, at \$1.90 on cars at Salem. Address Dir. of Pub. Service I. N. Russell, Salem, Ohio.

No. 346—Chicago, Ill.—This contract (p. 528), which provides for furnishing Sears, Roebuck & Co. with approximately 50,000 tons of steam coal, has been awarded to the **Ender Coal & Coke Co.**, of Chicago. The contract provides for 2-in. screenings, and it is understood that the coal will be shipped from the Livingston mine of the Rutledge & Taylor Coal Co. in Madison County, Ill. Address Pur. Agt. J. H. Westrich, Sears, Roebuck & Co., 925 Homan Ave., Chicago, Ill.

No. 353—Greenville, Mo.—This contract (p. 566), which provides for furnishing the Ozark Valley Ry. Co. with about 200 tons per month of 2-in. lump coal, has been awarded to the **West Virginia Coal Co.**, of St. Louis, at \$1.25 per ton at the mines. Address Purchasing Agent, Ozark Valley Ry. Co., Greenville, Mo.

†No. 354—Janesville, Wis.—The Janesville Machine Co. advises that this contract (p. 566), which provides for about 2500 tons of coal, has been closed. No details are available. Address Pur. Agt. C. O. Eddy, Janesville Machine Co., Janesville, Wis.

†No. 357—Pottsville, Penn.—This contract (p. 566), which provides for furnishing 400 tons of stove coal and 3000 tons of buckwheat coal, has been awarded to **Edw. H. Borda**, Schuylkill Haven, Penn., at \$1.83 for buckwheat and \$4.48 for stove. The only other bid submitted was from Charles Heissler, buckwheat, \$1.85, and stove, \$4.40. Address County Controller J. E. Kantner, Pottsville, Penn.

†No. 369—Bridgeport, Conn.—This contract (p. 567), which provides for furnishing about 16,000 tons of bituminous coal, has been awarded to **Archibald McNeil & Sons Co.** at \$3.95 per ton. Address Mgr. C. A. Paul, United Illuminating Co., Bridgeport, Conn.

†No. 377—Jersey City, N. J.—This contract (p. 567), which provides for furnishing the Municipal Building with coal until Mar. 31, 1916, has been awarded to **James Coyle**. The average price on the six grades involved was \$5.80 per ton. Address City Clk. Michael I. Fagen, City Hall, Jersey City, N. J.

†No. 393—New York, N. Y.—This contract (p. 567), which provides for furnishing the Hastings Pavement Co. with from 6000 to 9000 gross tons of bituminous coal, has been awarded to the **A. W. Hillebrand Co.** The contract was awarded on a specification basis. Address Secy. C. P. Pultz, Hastings Pavement Co., 25 Broad St., New York, N. Y.

†No. 400—Eagle Grove, Iowa—The Citizens Light, Heat & Power Co. at this place advises that it has contracted for its requirements to Apr. 1, 1916 (p. 567). Address Secy. J. A. Innes, Citizens Light, Heat & Power Co., Eagle Grove, Iowa.

†No. 403—Bayonne, N. J.—This contract (p. 567), which provides for furnishing the local Board of Education with about 2500 tons of anthracite coal, was awarded to the **Consumers Coal & Ice Co.** at the following figures: Pea, \$4.18; egg and stove, \$5.80; chestnut, \$6. Address Secy. of Bd. W. J. Tomlin, 26th St. and Ave. C, Bayonne, N. J.

†No. 433—Reading, Penn.—This contract (p. 626) which provides for furnishing about 2500 tons of pea, egg and stove coal has been awarded to **Elmer E. Moore & Bros.** on the following basis: Egg, \$5.38; stove, \$5.63; pea, \$3.68. Fehn & O'Rourke bid \$5.40 for egg; \$5.65 for stove; \$3.99 for pea. J. W. Holmes & Co. bid \$5.60 for egg; \$5.80 for stove, and \$4 for pea coal. Address Secy. F. Roland, Jr., Board of School Directors, Reading, Penn.

†No. 455—Clinton, Mass.—This contract (p. 627), which provides for furnishing the requirements for the local School Department during the ensuing year, has been awarded to **Connery Bros.**, at \$7.65 a ton for egg coal, and \$7.45 a ton for broken. Address Frederick E. Clerk, Clinton School Committee, Clinton, Mass.

†No. 466—Reading, Penn.—Awards on this contract (p. 628) which provides for furnishing 400 tons of pea coal and 50 tons of stove coal to the Berks County Prison, were: **J. W. Holmes & Co.**, 400 tons of pea at \$3.98; **H. J. Heck**, 50 tons of stove at \$5.60. Other bids on this business were: J. W. Holmes & Co., 50 tons of stove at \$5.74; H. J. Heck, 400 tons of pea at \$4; Loy & Liebold, 400 tons of pea, \$4, and 50 tons of stove, \$5.65. Address County Controller D. K. Hoch, County Controller's Office, Reading, Penn.

†No. 467—Somerset, Penn.—This contract, which provides for furnishing the local water-works with coal during the next year, has been awarded to the **Economy Coal Co.**, at 6c. per bushel for mine-run coal. Address Supt. C. E. Pile, Town Council, Somerset, Penn.